THE

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Editorial.

THE LATE PRINCIPAL WILLIAMS.

IT is with feelings of profound regret and great sorrow that we record this month the death of Principal Williams, senior editor of this Journal. Although the late Principal had been complaining a good deal during the last week or two before his death, and had suffered a good deal from a troublesome cough, yet no one, not even himself, suspected that death was so near. At the end of October, the Principal, who held, in addition to his other duties, the responsible post of a member of the Town-Council of Edinburgh, attended several public meetings held in Edinburgh for the purpose of selecting candidates for the Council and of hearing their views on the important topics of the day. In accordance with an Act of Parliament rendered necessary for the reconstitution of the Municipality of Edinburgh, the whole of the Council had to retire and a new Council be elected, and this, of course, caused a greater stir in the city than is usual on such occasions. The Principal, who had been twice in succession elected member for Broughton Ward, and had sat for eight years in the Council, did not seek re-election in November. He found that his professional cares were weighing very heavily on him, and he felt the need of at least comparative rest, as was quite natural in a man of his years, and he therefore tendered with regret his resignation of office to his constituents who had so loyally supported him through good report and evil report. At the same time, with that tenacity of purpose and that unswerving loyalty to his friends and to every righteous cause which he supported, he resolved to use his best, and, as has proved sadly evident, his dying efforts to secure the re-election of his old and staunch colleagues who wished to return to the Council. Accordingly, at much inconvenience to himself, the Principal attended ward meetings in the evenings, often after a

day of severe and harassing work, and of the inevitable anxiety connected with a veterinary surgeon's duties ; and thus he strove to perform his task as a Councillor manfully and steadfastly to the very end. It was a final consolation to him to know that his efforts were successful, and that his colleagues returned to the Council with large majorities, but the worry and trouble of these meetings undoubtedly hastened his death, which took place barely a week after the election.

If there was one quality that distinguished the late Principal more than another, it was his indomitable courage. Danger had positive charms for him, difficulties merely called forth fresh energies and new expedients. He paid little heed to surroundings when there was work to be accomplished ; even the well-meant warnings of his friends, anxious to secure his comfort, were carelessly brushed aside. Up to within a few days of his death he persisted in driving about in his open trap and holding the reins himself; it was useless to urge him to exchange his dog-cart for a brougham—such a course, desirable though his anxious friends thought it, seemed to him to border on effeminacy, and the Principal was essentially and thoroughly a man. He was infused with the fiery Celtic spirit which had descended to him from his ancestors, and which forms no unimportant element in our national character. He had all the enthusiasm of his race, their generous, though hasty, impulses, their impatience of restraints, their keen resentment of insult or neglect, their fervent emotions, which sometimes lead to outbursts of feeling, afterwards to be regretted and atoned for ; above and beyond this, he had the glowing imagination of the Celt, which is so powerful an auxiliary to the scientific man when coupled, as it was in the Principal's case, with native shrewdness and common sense, and securely based on wide learning and immense experience. This combination of qualities, whilst making him a formidable opponent to those who thwarted him, made him also a faithful and loyal friend ; he was a severe disciplinarian—the wildest student never for a moment thought of taking a liberty with the Principal—but he was profoundly respected amongst his young men ; every one of them felt that his discipline was simply the expression of salutary and universal law, and every one felt the benefit of undergoing such discipline, however irksome it might appear for the moment. Principal Williams never forgot old friends nor those who had

served him loyally. A graceful tribute was paid to him the other day by a friend of thirty years' standing, who now mourns the Principal's death—"I used to meet the Principal very often in the mornings as he drove down to the College; he often seemed absorbed in his own meditations, which, to judge by his face, were sometimes sombre enough; the streets were commonly crowded with traffic, but rarely did the old gentleman pass me without his kindly and courteous salutation, even when a momentary turn of the head implied a certain amount of danger."

It will interest many old friends of the Principal to learn that he was quite cheerful and able to converse upon the affairs of his College up to within a few minutes of his death. His son, Mr. W. Owen Williams, received a message on Monday morning, the 12th November, to the effect that the old gentleman was rather poorly, and wished to see him as soon as possible after his lecture at the College was finished. Mr. Owen Williams drove out at the earliest possible moment to his father's house at Crawfurd Road and found the Principal fairly well, though suffering from painful attacks of his cough. Mr. Owen Williams had finished his business and was preparing to leave the house when he heard a noise in his father's bedroom; rushing upstairs with a younger brother he found that the old gentleman had fallen forward from his bed and was in a semi-conscious state. Everything was done to restore animation, but to little purpose; the Principal could only gasp out a tender farewell to his sons and was gone. The immediate cause of death was failure of the heart's action.

We are reminded at this solemn moment of a pathetic passage in the biography of Dr. Norman Macleod. Writing in his diary, that tender-hearted and manly divine wonders why in the Litany of the Church of England the prayer should occur, "From battle and murder, and from sudden death, good Lord, deliver us." Macleod thought there was nothing terrible in sudden death; he thought it infinitely preferable to a slow lingering death, preceded by weeks of pain and suffering or of pure helplessness; he prayed that kindly death would come at the appointed time and remove him suddenly, and his prayer was granted when it seemed good to Almighty God to take the brave man to Himself. We are sure this was also the case with the heroic man whose departure we are now mourning. Had William Williams been asked to choose his

form of death he would certainly have chosen to die with his armour on his breast and his face to the foe.

It is obviously out of place for us to pronounce a panegyric on the late Principal. Family relations and literary connections demand a certain amount of reticence, although they also demand a certain frankness of utterance on such grave and painful events. We think it right in any case to append extracts from biographical notices which appeared in Edinburgh and other journals. These being written by men outside the editorial circle of THE VETERINARY JOURNAL, may fitly be quoted here without being thought impertinent or obtrusive. They contain information which our readers may wish to obtain and which ought to be at the disposal of veterinary surgeons. The late Principal was an outstanding man in his profession—in many ways a typical man; it is natural, therefore, to suppose that the young men of the profession will want to know how he steered his course through the stormy waters of life in order to arrive safe in port at the end; it is equally natural to suppose that the older men may wish to compare their efforts and their opinions with those of their departed friend. It is pleasant for us to record the laudatory expressions of able writers; it is a duty to the memory of the dead.

It only remains for those of us who were connected by ties of blood or marriage with the late Principal to express our deep sense of obligation to our friends and fellow-citizens who attended in such large numbers at the funeral. When the head of a family is removed and the bond which held the members together is broken, and painful thoughts are awakened and the future looms uncertain, it is specially consoling to see the highest and best amongst our friends gather round the open grave. When the dignified magistrate, the calm and patient man of science, the man who holds high office in the city, the clergyman and the lawyer, the man of letters and the man of affairs, all assemble to pay the last honours to the dead, the bitterness of death seems to vanish for the time, and we utter in our hearts the joyful and triumphant words of the great Apostle, "O death, where is thy sting? O grave, where is thy victory?" Surely he that is dead yet speaketh.

PRESS NOTICES.

From "The Scotsman."

A WIDE circle of professional friends and stock-breeders, not only in Scotland but throughout the kingdom, will receive with feelings of deep regret the announcement of the death of Principal Williams, of the New Veterinary College, Edinburgh, which took place very unexpectedly at his residence in Crawfurd Road, Newington, yesterday. The Principal, as one of the retiring members of the Town Council, was present at the last meeting of the old body a fortnight ago, and he then appeared to be in his usual health. He was able to attend to his duties at his College till Wednesday last, when he had a bronchial attack, which confined him to the house, but up till yesterday no serious symptoms were manifest. William Williams, who was one of the most distinguished members of the veterinary profession, was a native of North Wales, having been born at Bontnewydd in September 1832, and he was thus in his sixty-ninth year. He was descended from a race of veterinary surgeons, who, prior to the college qualification, were known as farriers, and he was the fifth of his family in a direct line who had made their livelihood mainly as doctors of horses and cattle. At the age of twenty, after having been a pupil for three years with a Lancashire veterinary surgeon, he went to Australia on account of his health, and in 1855 he returned to this country, and completed his training at the Dick Veterinary College in Edinburgh. He had a brilliant career as a student, and was one of four who presented themselves for the first Highland Society's gold medal, which he won—his fellow-competitors being Principal M'Call, of the Glasgow Veterinary College; Principal Law, of the Veterinary College, New York; and Mr. Field, London. Having finished his college training, Mr. Williams went to Yorkshire and established an extensive practice. On the death of Professor Dick, and the transference of his College to Trustees under the Town-Council, Mr. Williams was unanimously appointed Principal of the establishment in Clyde Street. He laboured there from 1866 till 1872, when some friction arose between him and the Trustees, and in consequence of that disagreement he dissociated himself from the old college and founded an institution of his own in Gayfield Square, which was afterwards transferred to the commodious and well-equipped premises in Leith Walk, now known as the New Veterinary College, where he has since carried on a successful school of veterinary teaching. Principal Williams was an outstanding man in the front rank of his profession. He was an acknowledged authority on all diseases of stock, and he was the author of two standard works, which are in use in the Veterinary Colleges throughout the world—"The Principles and Practice of Veterinary Surgery," which has run to nine editions, and "The Principles and Practice of Veterinary Medicine," which has reached its eighth edition. Before he became a Professor he was an Examiner of the Royal College of Veterinary Surgeons, and he was afterwards President of that body, and was at the time of his death a member of Council along with his son, Professor Owen Williams, who was conjoint editor with him of THE VETERINARY JOURNAL. The late Principal was also an Examiner for the Highland and Agricultural Society since they began to grant veterinary diplomas, and he was inspector for the county of Mid-Lothian under the Contagious Diseases (Animals) Act until

these appointments were abolished. He was likewise an Examiner for the Agricultural Diploma of the Highland Society, Examiner of Veterinary Hygiene at Edinburgh University, and an Honorary Member and Fellow of various Veterinary Medical Societies at home and abroad. Almost from the time when he first settled permanently in Edinburgh he has been veterinary adviser of the Highland and Agricultural Society, and in connection with that appointment he has been constantly engaged in inquiries regarding the diseases of the live stock of the farm, having conducted investigations into rinderpest and tuberculosis in cattle, pink-eye in horses, braxy and louping-ill in sheep, and other scourges which have afflicted farmers. In connection with his louping-ill inquiry he was the first to demonstrate that "ticks" conveyed disease to animals. Principal Williams was a regular attender at the Highland Society's Shows, where the animals entered had to pass under his inspection. He was frequently called as an expert witness in difficult cases, and his evidence, always given with force and fearlessness, begotten of sound conviction, never failed to carry weight. He was often consulted by Colonial Governments regarding diseases abroad, and many appointments have been made on his recommendation. At the request of the Government of Jamaica he went to that island a few years ago to report on the cattle plague which was decimating the herds there, and his recommendations have been carried out with beneficial results to the stock-owners of that country. Quite recently he was consulted by the Secretary for India with regard to the contemplated establishment of an Indian Civil Veterinary Department. As a skilled veterinarian Principal Williams occupied a foremost place in his profession, and no one was more highly gifted with a general knowledge of the branches of the science which he taught, while his lectures were always marked by a lucidity of style and a geniality of expression which carried his teaching home to the students. The late Principal did not take an active part in city affairs, but he had a wide acquaintance, and was personally greatly esteemed for his kindly disposition, cheery manner, and hospitable character. He was induced to enter municipal life about eight years ago, when he was returned to the Town-Council for Broughton Ward, and he filled that seat until the recent election, when he retired. He was also a Justice of the Peace for the city. Principal Williams was twice married, and was predeceased a few years ago by his second wife. He leaves three sons and two daughters, all grown up, his eldest son being Professor W. Owen Williams, who has been his father's partner and practical manager of the New Veterinary College for some years, and who has only recently returned from New Orleans, where he was engaged for nine months on the British Remount Commission in connection with the war in South Africa.

From "The Times."

MR. WILLIAM WILLIAMS, Principal of the New Veterinary College, Edinburgh, died yesterday somewhat unexpectedly in that city. Mr. Willlams, who was sixty-six years of age, occupied the post of President of the Royal College of Veterinary Surgeons in 1879, and was the author of a standard work on Veterinary Surgery. Four years ago he was sent out by the Government to Jamaica in connection with an outbreak of cattle disease.

(*From the "Edinburgh Evening Despatch."*)

By the sudden and lamented death of Principal Williams, a great leader in the ranks of the veterinary profession has fallen in the fight. The Principal's eminence as a teacher of veterinary science is known to every agriculturist and veterinarian in the country. His two great works—the one on "Veterinary Medicine" and the other on "Veterinary Surgery"—are used as text-books not only in the Veterinary Colleges in Great Britain, but also in America, and it was one of the great annoyances of the old man's life that his works had been so ruthlessly pirated by unscrupulous American publishers. But in point of eminence as a veterinary practitioner Principal Williams stood alone in his profession. Every man interested in pedigreed stock remembers the triumph of skill which the Principal achieved in regard to the champion bull "Enthusiast," which was condemned as tuberculous by practically all the veterinary Professors and experts in England; but the Principal had diagnosed the malady more accurately, and after having the animal in hand at the New College for a month, he sent the bull home sound as a bell, with the result that the animal afterwards won the championship at the Highland Show, and begot a race of champions which won first, second, and fourth prizes at the Royal Show of this year. Only the other month also the Board of Agriculture inspectors declared that they had detected the dreaded foot-and-mouth disease in several stocks of lambs in Perthshire, and at once the most stringent restrictions were imposed, prohibiting the movement of any kind of cattle or sheep stocks in Perthshire. But Principal Williams promptly showed that the malady in question was not foot-and-mouth disease at all, but was an obscure affection of a non-contagious character, and in less than a fortnight the Government inspectors were forced to admit that they were wrong, and that the Principal was right, and the disastrous restrictions were removed as promptly as they were imposed. The Principal was a man whom no consideration could cause to swerve from what he considered just and right, and in the matter of public appointments he suffered greatly from the determined position which he took up against the Government veterinary authorities in regard to the so-called pleuro-pneumonia in Canadian cattle, the Principal holding that the malady in question was not pleuro at all, but was neither more nor less than broncho-pneumonia, which is non-coatagious in character. Personally the Principal was one of the kindliest and most genial of men, and all his students had the warmest regard for him. It may be remembered that only last summer the students from his College carried off the first, second, and fourth Fitzwygram prizes, open to all the students from all the Veterinary Colleges in Great Britain. Such a triumph was unique, and it formed a fitting crown to the old Principal's long and highly successful career as a veterinary teacher.

From the "Edinburgh Evening News."

Very general regret will be felt throughout Scotland at the death of Principal Williams, of the New Veterinary College. He was a man of grit and sterling ability, and unquestionably he was at the head of his profession in Great Britain. Veterinary science has of late years made immense progress. Almost within the lifetime of the late Principal it passed from a

peculiar industry to a recognised and eminent profession, now acknowledged as not only essential to animal life, but to the health of the public. Instead of the old empirical methods of the country horse-doctor, we have specialists at work with great and growing results, and it was Principal Williams' good fortune to assist in bringing in this new era. There have been times recently when it seemed as if the profession had entered on a period of stagnation, but to-day the outlook is more promising and any cause for doubt has passed away. This is not the place to enter into the bitter controversy over the Veterinary Colleges of Edinburgh, but the fact that Principal Williams was able to found a new college and give it a national reputation was standing proof of that pluck which is always admirable, and of that professional and practical knowledge which commands success.

(*From the "North British Agriculturist."*)

On Monday a shock of painful surprise thrilled the heart of the country when it became known that Principal Williams had been called away by death. The shock was all the more painful on account of the sudden and wholly unexpected character of the news, for there were many who knew that the Principal had only returned the other day from England, where he had been engaged in tracing the cause and character of an obscure outbreak of disease. On Wednesday last, however, the Principal was unable to attend the meeting of Highland Society directors on account of his having a cold, but there were few who ever dreamed that the Principal was then so near the borderland.

The deceased Principal was a Welshman by birth, having been born at Bontnewydd in September 1832, so that he had passed the sixty-eighth milestone on the road of life. He was descended from a race of farriers, and was in fact the fifth of the family who made their livelihood as horse and cattle doctors. At the age of seventeen he became a pupil of a Lancashire veterinary surgeon, but three years later symptoms of consumption began to manifest themselves in his system, and he went to the Australian gold diggings, where he "roughed it" with varying but tolerable success for over three years. The three years' life at the Australian diggings proved as good as a prolonged residence in a sanatorium to him, and on finding that the tubercle bacilli had been thoroughly eradicated from his system, he returned to the old country and completed a course of veterinary training under "Old Dick." At the Dick Veterinary College he was one of four students who competed for the first gold medal offered by the Highland Society for proficiency in veterinary science, and he carried off the coveted honour, his fellow-competitors on that occasion being Mr. M'Call, now the Principal of the Glasgow Veterinary College; Mr. Law, now the Principal of the New York Veterinary College; and Mr. Field, London. After completing his course at the "Dick," the Principal went to Yorkshire, where he soon built up for himself a large and lucrative practice. On the the death of Professor Dick and the transference of the Dick College to trusteeship of the Edinburgh Town-Council, Mr. Williams was unanimously appointed Principal of the Royal (Dick) Veterinary College in Clyde Street. The Principal continued in that post from 1866 to 1872, when he resigned that post on account of intolerable friction with a section of the Trustees, that friction being mainly caused and assiduously fomented by an

outsider who was a relative of Professor Dick. On shaking the dust of Clyde Street off his feet, the Principal established a College of his own, first in Gayfield Square, and afterwards in the commodious and splendidly equipped premises which he built for himself in Leith Walk, his College being known far and wide as the New Veterinary College, Edinburgh. When he left the Dick College the great body of his students left with him, so that his New College was well filled from the first, like the river starting from the Alpine glacier—a river at its birth. Here the Principal has laboured for the last eighteen years with remarkable success as a teacher of veterinary science. In this connection, it may be fittingly recalled that last summer three students from the New College won respectively the first, second, and fourth Fitzwygram prizes, open to all the students from all the veterinary colleges in the kingdom, and this unique triumph of the old Principal's skill as a teacher formed a fitting round-up to his life's work. Amidst all the multitudinous duties which passed upon him as a veterinary teacher and practitioner, he also found time to write two standard works, the one on *Veterinary Medicine*, and the other on *Veterinary Surgery*. These are books which every one who aims at being up to date in the veterinary profession requires to be well acquainted with, and they are used as text-books, not only in the Veterinary Colleges of Great Britain, but also in the Veterinary Colleges of America. In fact, it was one of the worries of the Principal's life that his books had been so ruthlessly pirated by unscrupulous publishers in America. His book on *Veterinary Surgery* has passed through nine editions, and his other book—that on *Veterinary Medicine*—is now in its eighth edition. For many long years the Principal has been Veterinary Adviser to the Highland and Agricultural Society, and he conducted numerous important investigations in veterinary matters for that Society, and was a frequent contributor to its annual *Transactions*. In later years, also, he acted conjointly with his oldest son, Professor W. Owen Williams, as editor of THE VETERINARY JOURNAL.

As a veterinary practitioner Principal Williams earned for himself a reputation which was absolutely unique. Those who are interested in pedigreed stock will well remember the triumph of skill which he achieved in the case of the famous Aberdeen-Angus bull "Enthusiast," bred at Ballindalloch, and owned by Mr. Patrick Chalmers, of Aldbar Castle. Shortly after being bought for Aldbar Castle, "Enthusiast" developed a tumour in his throat, which tumour was pronounced by a host of veterinary experts to be of a tuberculous character. The tumour grew rapidly worse, and although practically all the leading veterinary professors and experts were called to see him, they all shook their learned heads and declared it a clear case of tuberculosis, which had made the "case" a hopeless "piner." On the other hand, Principal Williams declared it a case of actinomycosis, and he guaranteed that, if the bull were sent to his College to be operated on and treated, the animal would be sent home sound as a bell in the course of a month. The bull was accordingly sent on to the New Veterinary College, where the Principal excised the tumour, and the animal was sent home within the guaranteed time, with the result that he not only lived to win the championship at the Highland Show, but what was better, he begot a race of champions like himself, one of which—Diaz, owned by Mr. Shaw Adamson, of Careston Castle—won the championship of the Aberdeen-Angus breed at both the Royal and the Highland Shows of this year, a couple of other "Enthusiasts" taking second and fourth prize

respectively at the "Royal." And not only so, but when at a ripe old age "Enthusiast" himself was sent to the block some few months ago, a most careful post-mortem was made, and not a trace of tuberculosis could be detected about him. Some four years ago, also, the Government of Jamaica commissioned the Principal to visit that country and investigate an obscure disease which was decimating the cattle stocks there, and it was a source of great satisfaction and pride to him that his recommendations, when acted on, proved highly successful in checking the ravages of that disease. Only a few weeks ago, also, the Veterinary Inspectors of the Board of Agriculture declared that they had detected foot-and-mouth disease amongst several stocks of lambs in Perthshire, and at once the most stringent restrictions were imposed by the Board of Agriculture, prohibiting the movement of all cattle and sheep stock in Perthshire. But the farmers in Perthshire summoned the veteran Principal to diagnose the alleged cases of foot-and-mouth disease, with the result that he proved the disease to be not foot-and-mouth disease at all, but an obscure disorder of a non-contagious character, and in a fortnight's time the Government inspectors had to confess that they were all wrong and the Principal was right, so that the restrictions, which, if continued, would have spelt ruin to Perthshire stockowners, were removed as quickly as they had been imposed, and the county breathed freely again. The Perthshire stockowners testified very warmly to the invaluable service which the Principal had rendered in standing between them and the restrictions, which would have paralysed the live stock trade of Scotland. The Principal in his day often had to make great pecuniary sacrifices on account of his determined refusal to accept the dicta of those in high office, and numerous Government appointments were put past him on account of his refusal to accept the diagnosis of the Government veterinary authorities in regard to the so-called pleuro-pneumonia in Canadian cattle, the Principal holding that the malady detected in the lungs of the Canadian cattle was not pleuro at all, but broncho-pneumonia.

But the heroic Professor now rests from his labours, and in his death many hundreds of veterinary students and British stockowners will sincerely mourn the loss of a true friend and a valued adviser. Personally the Principal was one of the most genial and kindliest of men, who, when he met a good man, made him his friend. and "grappled him to his soul with hooks of steel." His death will cause a blank in the veterinary profession greater even than that caused by the death of Professor Dick a quarter of a century ago.

THE FUNERAL.

(*From the "Scotsman."*)

Yesterday afternoon the remains of Principal Williams, of the New Veterinary College, Edinburgh, were interred in Warriston Cemetery. The attendance at the funeral, which was from the late Principal's residence in Crawfurd Road, Newington, was large and representative. There was a company of fully two hundred, and the procession, consisting of some forty carriages, following the funeral car, which was drawn by four horses, presented an impressive appearance. Among those present were Lord Provost Steel, Treasurer Cranston, Mr. Thomas Hunter, W.S., Town-Clerk; Mr. Paton, City Chamberlain; and a large number of the late Principal's colleagues in Edinburgh Town-Council; Principal M'Call, Glasgow Veterinary

College; Principal Dewar, Royal (Dick) Veterinary College; and a representative body of the veterinary profession from all parts of the country; Mr. James Macdonald, secretary of the Highland and Agricultural Society, and a number of the directors of that body, of which Principal Williams was veterinary adviser; Professor Wallace, Edinburgh University; Dr. Marshall, Royal High School; the Rev. Canon Ellis, St. Paul's; and a large number of agriculturists who had been associated with the deceased in various branches of work. The students of the New College marched in a body in front of the hearse. Amongst a number of floral wreaths which were placed on the coffin and in the hearse, was one in the form of an anchor, from the Principal's College staff and students. The pall-bearers were Professor Owen Williams and Mr. Herbert N. Williams (sons), Mr. C. Blackhurst (son-in-law), Dr. Hunter, representing the staff of the College; Mr. R. Scott, representing the students; Mr. F. Somers, President of the Yorkshire Veterinary Medical Society; Mr. Bell, V.S., Carlisle, representing the late Principal's fellow-students; and Mr. D. Treehearn, Rhyl (nephew). The Rev. C. J. Jenkins, St. James' Episcopal Church, Inverleith Row, conducted service in the house and at the cemetery; and at the graveside a Welsh hymn was sung by a choir. Mr. Peter Moir carried through the funeral arrangements.

(*From the "Veterinary Record."*)

Although the late Principal's name will always be associated with Scotland he was a Welshman, having been born at Bontnewydd in 1832.

As in the case of another great man—Cecil Rhodes—who went to the colonies in fear of tuberculosis, Professor Williams made a complete recovery, and those who only knew him in later life will be surprised to hear that he ever suffered such an escape from dire disease. On returning home he entered as a student at Dick's College, Edinburgh, and soon gave evidence of more than ordinary proficiency, carrying off the highest prizes in competition with men who have since risen to eminence. After graduating in 1857 he commenced practice at Bradford and soon established a reputation as a first-class practitioner.

In 1866 the death of Professor Dick was followed by the Clyde Street College being taken in trust by the Town-Council of Edinburgh. Professor Williams was selected as Principal and occupied the post for about five years. This period of work was not altogether comfortable, owing to the interference of some of the Trustees, and it culminated in Professor Williams resigning his position and establishing a College of his own. The first site of the New Veterinary College was Gayfield Square, in the east end of Edinburgh. The new school was a success from the commencement, as the students from "Dick's" followed their teacher, and the old school was left empty. The accommodation at Gayfield was soon found insufficient, and the Principal erected the large and suitable premises in Leith Walk, which are now so well known as the New Veterinary College.

Shortly after Professor Williams' appointment to the Principalship of the Dick College he was elected a Vice-President of the Royal College of Veterinary Surgeons. In 1872 he became a Member of Council, and has ever since occupied a position on our representative body. In 1879–80 he filled the Presidential chair. He was in 1877 one of the eminent men selected as Foundation Fellows when the higher degree was provided by Charter. For many years he has been Veterinary Adviser to the Highland

and Agricultural Society of Scotland, and his reports on various professional investigations are to be found in the Society's Annual *Transactions*.

Professor Williams was a Fellow of the Royal Society of Edinburgh, and a Justice of the Peace for the city. In recent years he has interested himself in municipal matters, having been first returned to the Town-Council as member for the Broughton Ward in 1892, and retaining his seat up to the last.

As a teacher Professor Williams had something of the force of character of his old preceptor Professor Dick, and he had the power of impressing his students in a remarkable degree. The Fitzwygram prizes are open to the graduates from all veterinary schools. These prizes are specially arranged to test the "practical" knowledge of the competitors, and it is a remarkable fact that students from the New Veterinary College have obtained the lion's share of success in these contests.

As a consultant the late Principal was sought far and wide. His reputation as a clinical adviser was unique. His great experience, sound knowledge, and clear logical intelligence made his diagnosis wonderfully correct, and rendered his advice most valuable. All veterinarians will remember more than one case where his opinions were accepted by a few and denied by many, but time did him justice. His research into the cause of louping-ill led him to connect the "tick" with its spread, and to advise the rigorous destruction of ticks. We now accept his conclusions.

Years ago, it was supposed that a disease found in cattle landed at Liverpool from the United States was contagious pleuro-pneumonia. Williams urged that it was not, but few credited him at that time with being correct. Years passed on, and a similar disease was discovered in cattle imported from Canada. The officials diagnosed it as contagious pleuro-pneumonia, but Professor Williams again showed the difference, and asserted it was not the dreaded plague. Time has proved that no pleuro-pneumonia contagiosa exists in Canada, and it is impossible to believe that such a disease could have remained without discovery in any country for six or eight years. If the official advisers had been correct, Canada would now have been visibly infected. Quite recently Professor Williams rendered his country good service by verifying the diagnosis of Mr. Clarke, of Coupar-Angus—that the disease in Perthshire was not "foot-and-mouth." On this occasion the authorities accepted his decision.

Success attended the Principal's visit to Jamaica when a fatal disease was destroying the herds of the island. His advice was followed, and the disease was stayed and then subdued.

As an author, Professor Williams has filled a big place in veterinary literature. His works on "Veterinary Medicine" and "Veterinary Surgery" have been the standard text-books for students and practitioners for nearly thirty years, and have reached a ninth edition. What assistance they have been to students in Great Britain and in all the English-speaking countries it is impossible to say, but their effect has been enormous. Without them, only those who read German or French could have reached any proficiency. The books are marked by the personality of the author—clear description of what he had seen, and sound inference from facts he had collected.

By his friends and acquaintances the late Principal will be remembered as a genial and kindly man, full of sound common sense and business industry. By the veterinary profession his loss will be felt acutely, and no one may yet anticipate its more distant effects.

SOME YOUTHFUL EXPERIENCES OF THE LATE PRINCIPAL WILLIAMS.

THAT the late Principal had had a varied and in many respects an exciting life, his many friends well know; but we venture to think that the following anecdotes of his earlier days in Australia will prove acceptable to our readers, differing, as these youthful experiences do, so widely from the average present-day life of the veterinary student. We give them as he once related them to a journalistic friend in Edinburgh.

"I am a Welshman, and was born at Bont Newydd, where my father and ancestors generally had lived 'ever since Noah was a boy.' They were farriers, who disdained to attend a cow, and though their vocation included the doctoring of horses, their main occupation was to shoe horses, and very often they lamed them in the shoeing. My grandfather practised as a veterinary surgeon, but his powers as a physician were very limited. He knew little or nothing about medicine, but he had a wonderful prescription for every disease, which answered the purpose admirably, as his cases generally got better. My father was a man of genius without a portfolio, and an inventor of many things which never came off. I shall give you an instance of this. I had to visit Birkenhead on the pleuro-pneumonia question, and was taken by the veterinary surgeon appointed by the United States Government to make inquiries on board the steamer 'Alaska.' It was then the fastest boat afloat, and when I first saw her she was floating like a duck on the waters. I said to my friend—'That is a steamer invented by my father twenty years ago. She has a breast like a duck, and is narrow behind, and the effect is this, that she cleaves the water with her breast, the water rushes together again at the stern, and pushes her forward.'

"With all his genius, however, my father was only a Welshman with the gift of tongues, who ought to have been at the head of a theological college. He spent his time and his money in teaching students of divinity, and every Sunday night he provided a free supper, which consisted of a round of beef, pickled cabbage, potatoes, and as much beer as they could drink. Ministers of all denominations used to come to the house. Even Roman Catholic priests visited it, and I have known a Baptist minister, with his wife and six of a family, living in my father's house for six months free of charge. I may add that my father was a Baptist.

"I went to school at the village of Clocaenog, near Ruthin, and it was there I first began the study of the English language, induced to do so by hearing the phrase, 'See the conquering hero comes.' After being well grounded in the rudiments, I went to a grammar school. Finishing my education in Liverpool, I became a pupil with a Mr. Fishwick of Oldham —a veterinary surgeon with a large practice. While in Liverpool I had not been idle, and had attended the scientific lectures delivered at the Mechanics Institute, besides which I had studied chemistry under Dr. Sheridan-Muspratt. It was my intention after having served with Mr. Fishwick for a period to go to college, but my health broke down, and I was induced to sail for Australia.

"I started in July 1852, and before I had crossed the equator I felt like a 'lion refreshed.' The voyage out was delightful, so far as the weather was concerned, but it was spoiled by the Yankee captain's brutality. He was a perfect martinet, and flogged the sailors for the most trifling offences.

The ferocity shown on the voyage had its inevitable result. When the ship arrived at Hobson's Bay every man of the crew, and one of the officers, deserted. I was able to disembark the same evening, and once on shore my difficulties began. I was told that the charge for keeping my boxes on shore would be 4s. per week, and at that rate my ready-money would soon have vanished. I determined to sell the goods, and got a Jewish broker to look at them. He made me the munificent offer of £2 for the stock, which I valued at not less than £40, and wished me to throw in my pistol with the other things. I am afraid my method of concluding negotiations was more forcible than polite. I determined to sell my things by auction, and got a man to help me down with them to the quay, then known as Rag-fair. I mounted a box and started to shout lustily that I had got a fine selection of the latest fashions from London, which I was willing to dispose of. So well did I succeed that I eventually got £11 for them, although I had retained the pistol for use in the gold-diggings, to which I had naturally turned for a livelihood.

"After a time I went to Ballarat, and there bought the ninth part of a claim for £250. Above me—and the point is interesting, as showing how tremendously variable the luck was—were claims which produced from £80,000 to £90,000 each, and yet I and my eight companions toiled on for eighteen months, and did not make enough to pay for the shafting and the tools. My capital soon became exhausted, and on counting it over one Sunday morning I found I had only £7 left. I determined to leave the place, and in company with a friend called Benson I started for Yamholes. Fortune was kinder to me there, and we struck upon a hole which had been dug out by some one previously to our arrival. Taking a sample of the washings we discovered gold. With renewed hope we began to dig deeper, and at a short distance from the surface we came upon a deposit—a perfect "Bank of England." But our dreams of wealth were doomed to disappointment. We got into water, and as we were unable to pump it ourselves, we tried to create a rush of miners to the spot by advertising it. The boom did not work, and we had to leave the spot with regretful feelings. Shortly afterwards we had the mortification to see the rush we so much desired take place, with the result that the claims turned out to be immensely rich, and many men made their fortunes out of them.

"From Yamholes I proceeded to a digging called the Adelaide Lead, and got on a claim which turned out to be the hardest piece of digging I had ever tackled, and I was just about to give up the place in despair, when a friend in the claim above suggested that the lead turned to the right. With redoubled energy I worked on, and about two feet further in I got into gravel. When I saw that gravel I thought I was at last in all the banks of Scotland. Had the store been as large as I expected, I don't think I should have been a veterinary surgeon in Edinburgh. As it was, I made several hundred pounds for my share before the damp and hard work produced the undesirable accompaniment of rheumatic fever.

"On another occasion I was very much down in my luck. I was at Bendigo, and with two other companions worked very hard at a claim without satisfactory results. After a couple of months our total yield was two ounces of gold. We were 'dead broke,' and drew lots which two out of the three should apply for a job on the road to make money. The lot fell upon me and my chum Edward Norbrough, and we went down to Sawpit Gully, where we got work at the remuneration of 3s. for every

yard of earth cleared away, and 5s. for every yard of stones. Wages were not to be paid for a fortnight, there was no trust at the store, and bread was selling at 6s. 6d. per 4 lb. loaf. Under these conditions we were in straits. I asked my friend where on earth our next meal was to come from. He just looked up and said, 'There is a little cherub sitting up aloft that looks after poor Jack.' About five minutes afterwards a tall, stooping man came along, and asked us if we had seen any signs of a bullock he had lost. We said no. 'You are not new chums,' he added. I told him we were not. I noticed him looking at my mate intently. Then he said, 'Is your name Norbrough.' Ned looked up. 'Yes,' he said, then added, 'Good God, Shotten, is that you?'

"To make a long story short, it may be said that both men had been in the same warehouse together in London, and had emigrated, unknown to each other, to Australia, to be reunited in this strange fashion thousands of miles away. The fortunate meeting soon led to the disappearance of monetary difficulties, and each night saw us at this friend's shanty, where we met another resident—a baronet when in England, but a maker of boots in Australia. We were all four enthusiatic whist players, and in a general gamble we managed to repay a loan we had had from Shotten.

"A few days after these incidents, the surveyor came to me at the workings, and I soon found out that he knew nothing whatever about measuring. He asked me if I could measure, and I answered him in the affirmative. 'Well, measure that tree,' he said, and when I had done it he offered me £20 a week to assist him. It was in that way I became assistant road surveyor, and for about three weeks I went about with this man, who was certainly not fit for his work. After the three weeks were over I went with my friend and a Welsh doctor to the diggings at Bendigo, and when there we had the misfortune to be arrested for not possessing the necessary Government license. Summary justice would have been dealt out to us had I not retained my presence of mind. After a march of nearly twenty miles, during which many more unlicensed operators were taken into custody, we reached the camp where the Commissioner was in residence. Procedure in the law courts was of the shortest possible nature. The offenders were brought up in batches, and in the first of these I was along with Norbrough and two other miners, total strangers. The Commissioner asked me what I had to say for myself. 'Please, my Lord,' I said, 'I am a Government servant.' 'Oh, indeed, where were you employed?' I told him that I was assistant surveyor, and that my mate and I had come up to see if we should remove there. 'You were not digging at Golden Gully at all then?' he asked,—and added, 'You are discharged.' The whole four of us were accordingly dismissed, a fact we rejoiced over greatly, as the usual punishment was £5 or ten days.

"Just one incident more, to show you how near a man may be to fortune and yet miss it. Another miner was in a tent adjoining mine. We were both working at unremunerative claims, and I gave the place up as a bad job. My surprise was considerable when I heard later that the other miner had found a fortune under the gravel floor of his tent."

Friends of education will be gratified to hear how the Principal summed up his experiences of society in Australia in those wild times. "There were certainly blackguards there, but the influence of the men of education was so predominant that the lower orders were kept in subjection."

THE LATE PRINCIPAL IN JAMAICA.

As is well known, the Principal was asked by the Government to proceed to Jamaica a few years ago to investigate the causes of a disease which had been very fatal in the island. He did so, and was able to prescribe effectually for its cure. Word was sent to him some time after he had arrived home that in the provinces of St. Mary and St. Elizabeth, where the disease had been most prevalent, the cattle were now perfectly healthy. When asked by a friend how he had enjoyed the experience there, and the voyage out, he replied, "It is a beautiful island, and most of the best men in it are Scotsmen. They treated me everywhere with the greatest kindness and hospitality. The voyage both there and back was delightful, with the exception of one terrible night of thunder and lightning. One of the masts was struck during the night by lightning, and I thought we were going to the bottom. I found in the morning that we had been in great jeopardy."

When asked for his opinion of the questions between the black and white races, he replied, "My opinion, and I am rather loth to give it, is that things are rather bad in Jamaica socially, and the time may come when the blacks will overwhelm the whites. The morality of the negroes is very lax,—the women being disinclined to marry. When asked to do, they invariably reply—'Me no marry.—Him marry me, him thrash me!'"

SOME MINOR REMINISCENCES.

It only remains for us to mention some of the deceased Principal's hobbies. He was extremely fond of music—like so many of his countrymen—and although not a performer on any instrument he took the keenest interest in musical affairs. In his youthful days he would think nothing of starving himself for days together, if thereby he could save enough money to take him to the theatre when a good opera company was in Liverpool. In later times he was present at the performance of practically every new opera, not to speak of hundreds of visits to see old favourites. As a lover of music and a patriotic Welshman, he attended regularly the meetings of the Eisteddfodd, and took the greatest interest in them. He never forgot his Welsh, and it was delightful to see him, as the writer of this notice once did, at a meeting of Welsh students, when they dined together on St. David's day, and watch the inspiration which went forth from the old man to the young men. One might be quite ignorant of the quaint old-world language which the Principal spoke, and yet feel caught up in the enthusiasm which the brief phrases called forth. At the old Principal's grave a number of Welsh students chanted a strange mournful dirge, which had a thrilling effect on the other mourners.

The late Principal's chief amusement in later years was angling, which has been so charmingly described as "the contemplative man's recreation." He was a member of the Walton and the St. Andrew Angling Clubs, and held many gold medals as trophies of his piscatorial skill.

Although not exactly a hobby, the giving of evidence in law cases was a source of much interest and even amusement to Principal Williams. He was an excellent witness, and being an acknowledged expert, his opinion was highly valued and greatly in request. He was naturally fearless, and he had the additional security of knowing always more about the matter

in hand than the judge, barristers, and jury combined. He studiously avoided technicalities, he did not need to shroud his meaning in pompous phrases. When a pedantic or conceited advocate had concluded a high-sounding sentence, bristling with Latin and Greek words, the Principal would repeat part of the sentence, to show that he knew his Greek also, and then add in a half-scornful, half-pitying tone, "I presume you mean so and so"—giving the homely and familiar name of the disease. This never failed to enlist the sympathies of the jury,—honest fellows,—and frequently drew forth a quiet smile from the judge as he beheld the evident discomfiture of the advocate, and thus confidence was established, and the Principal was able to obtain a verdict for his side. But he is gone, and now we may say with Hamlet—

"He was a man, take him for all in all,
We shall not look upon his like again."

Original Papers.

INFLUENZA.[1]

BY WILLIAM MARSDEN, ESQ., M.R.C.V.S., BANFF.

THIS term is derived from the Italian, and distinguished from common catarrh by the severity of its symptoms.

The different forms of influenza.—I. Catarrhal Fever. II. Bilious Fever. III. Epizootic Cellulitis.

I.—CATARRHAL FEVER.

It is the typical form of influenza, it is sometimes panzootic, and is known all over the world, and assumes more serious characters in some countries than others. It is indigenous in the horse, and originates in the studs of dealers. It is usually mild in its character, but sometimes assumes a very malignant type. Its incubation is from four to five days,—duration ten or twelve. Its range of infection spreads to great distances, and is carried by horses themselves. It attacks all classes of horses, but those which are neglected, uncared for, and overworked are more susceptible.

Symptoms.—I need not repeat the symptoms of an ordinary case of catarrh, but simply of that as the disease advances. The pulse rises to about 60 or 70. In the most asthenic forms it is soft and weak, and in the sthenic forms hard and full. Respirations are increased to twenty a minute. Temperature 105° or 106°, extreme 107°. The membranes are markedly injected. There is a copious discharge of a muco-purulent character from the nose and occasionally from the eyes. The discharge is healthy,—no smell; as time goes on it may become tinged with blood; it may even contract an unpleasant odour by the decomposition of pus and membrane. The glands become larger, hot, and painful, and they may go on to form matter, as in strangles. The appetite is indifferent or totally suspended. Spontaneous diarrhœa takes place as time goes on, and the fæces may be fœtid and mixed with blood in the worst cases. The mouth

[1] Read at the August Meeting of the North of Scotland Veterinary Medical Association.

becomes fusty and dry, and pustules form in the Schneiderian membrane, and the animal becomes emaciated and extremely weak. The worst thing in catarrhal fever is lung complications, in which we may have inflammation of the bronchial mucous membrane and lungs themselves, due to extension of inflammation from the upper air passages; they are of a low character, and the worst class to deal with (asthenic); mortification and abscess follows.

Treatment.—Aconite combined with ammon. carb. and sulph. magn. in water. If bowels much constipated, linseed oil with injections.

In lung complications, stimulating lin. to sides, and hot cloths to sides for twelve to forty-eight hours. Head steamed with tinct. of benzine in hot water, and if there is odour in breath, creosote. For glands of throat a little stimulating lin. The animal should be placed in good hygienic surroundings with an even degree of temperature, and if weak put in slings; if not, bed with straw or sawdust, but animals seldom lie with this fever.

When convalescence is established, ammon. carb. and sacch. carb. ferri and nux vomica.

Results of Catarrhal Fever.—Nasal gleet, chronic cough, thick wind, swelling of the limbs, rheumatism, congestion of the serum and clotting of blood in the heart.

Post-mortem Appearances will find an altered condition of the blood and effusion in different parts of the body. The lungs have a brawny mottled appearance, and on cutting through them pus oozes, mixed with blood. The bronchial mucous membrane is black and dark green colour, and even ulcerated instead of healthy brown; will get broken-up lymph.

II.—BILIOUS FEVER.

It is epizootic, and attacks numbers of horses at once. It is mild in some seasons, in others very destructive, but it will be regulated by the sanitary condition of the stable. Its distinguishing feature is the yellowness of the mucous membranes of the eye and mouth. The yellowness is due to the jaundice, as the result of the action of the poison upon the liver; it may be in a state of congestion, and the mucous membranes so swollen that the bile cannot be thrown out in the ordinary way, and becomes absorbed in the blood, and produces jaundice. The absorption of the bile into the blood is very important; it complicates the case and poisons the blood, and renders it more difficult to deal with. The yellowness may vary from a slight tinge to a deep orange light colour.

Incubation.—About four or five days.

Its duration.—About ten to twelve. Ordinary cases four or five.

Its invasion is sometimes very pronounced, in others it is insidious, and the animals may work in a high state of fever for two or three days without attention being arrested.

Temperature.—Sometimes averages 107°.

Pulse.—80 or 90, and animal scarcely able to walk.

Symptoms.—Loss of appetite. Bowels constipated. Fæces clay coloured; there may be a little cough, with dullness, and head resting on manger. About the fourth or fifth day the temperature may suddenly lower, and pulse reduced; respiration hurried and laboured; this indicates effusion into the lungs. In most instances the serum will

become absorbed, and when there is absorption we get a discharge at the nose of a yellowish rusty colour, which dries just like a yellowish pigment. This happens in those cases which recover. When there is no discharge from the nose the effusion is changed, and inflammation of lungs the consequences. The condition of the urine is a symptom. If pretty copious and thick it shows the waste material has been cast off. Spontaneous diarrhœa does no harm unless it goes too far.

Convalescence.—The first sign of recovery is the clearing up of the mucous membrane, and the mouth becoming moist and sweet.

Treatment.—Large doses of ammon. carb. and nitric ether, with magn. sulph. in drinking water. If the heart shows signs of wavering or ante-mortem clotting, liq. ammon. fat diluted with whisky, and a little digitalis every hour. If we get effusion into the lungs, iodid. potass. with ammon. carb.

Results.—Purpura hæmorrhagica, rheumatism, and laminitis.

III.—EPIZOOTIC CELLULITIS OR EFFUSIVE FEVER.

It is a continued fever in the connective tissue of the body, and due to a specific virus. It is epizootic and somewhat panzootic. Its spread is rapid. It is mild in its character, but proves very destructive in horses which are overworked and badly fed, and living under bad sanitary arrangements.

Incubation.—About four or five days. Its invasion is very rapid; it will frequently happen that a horse will go out for his work, after eating his morning food, and coming back scarcely able to go into the stable. It is contagious in a sense, and is infectious. One attack does not confer immunity from another.

Symptoms.—In the early stage there is sudden swelling of some part of the body, preceded by fever, prostration, and great weakness. The swellings may commence in one of the limbs about the hock to the fetlock, and in some instances confined to one of the joints; in this case the swelling is accompanied by great pain, and the joint is hot, and the animal constantly picks up the limb; in some instances the eyelids become so swollen as to close the eye; in some cases it may commence like laminitis. These swellings are metastatic; if the animal has suffered from an attack of weed, it becomes enormously swelled. Sometimes the effusion is localised in the bowels and lungs, and gives rise to colic and congestion of the lungs. There is always in the early stages fever, conjunctiva of a pink colour, occasionally a little yellow and moist. Breathing sometimes rapid; the appetite may not be interfered with. As the disease advances the swelling is increased to an enormous size along the abdomen and sheath, and may be confounded with purpura hæmorrhagica if the eyes be red. The cornea becomes dropsical, with profuse discharge of tears, followed by muco-purulent matter, and also from the nostrils. The pulse may be 120, and is weak. Temperature runs up as high as 108°-109°. Respiration extremely hurried and difficult. Emaciation very rapid, and the animal may lie down at the commencement, and if the case goes on to death, the swellings increase enormously; extreme weakness, and staggers if attempt to rise. Temperature high, the beat of the heart becomes laboured, and the animal dies from ante-mortem clotting. If the external swellings disappear suddenly, will get œdema of the bowels or dropsy. Death takes place in four or five

days. Occasionally effusion takes place into the cerebro-spinal cavities, producing symptoms of brain and spinal cord.

Convalescence.—The first sign is freedom of movement, disappearance from the cornea and joints of œdema; symptoms of fever pass away; the lymphatic vessels also return to their normal state, and lowering of temperature and pulse.

Treatment.—Put the animal in a favourable position, pure air, plenty of cold water, and put in a loose box, and bed with sawdust or straw. In the early stage I give ℥iij or ℥iiij of aloes with nitric ether and ammon. carb., and plenty of whisky and gruel, and keep them up.

Local Treatment of Swelling.—If there are signs of laminitis—poultices; for the joints anodyne liniment. For the eyes bathe with zinc lotion or scarify the cornea and steam the nostrils, and if colic, treat as so.

During Convalescence.—Give hydro-nitro-chloric ether and plenty of rest. In large studs isolate every case whenever they come in. For the effusion, salicylate soda and iodid. potass.

Results of this form of Fever.—Effusion into the pericardium.

Post-Mortem Appearances.—The muscles are pale and soft, and will find water everywhere.

WOUNDS AND WOUND TREATMENT.[1]

BY TREVOR F. SPENCER, ESQ., M.R.C.V.S.

(*Continued from page 232.*)

CLASSIFICATION OF WOUNDS.

A wound is a solution of continuity of soft structures normally conjoined. Wounds may be—

Accidental, which are again classified as—
Surgical when caused by operative interference;
Open when the skin is divided; and
Subcutaneous when the tissues beneath the skin are divided, with no breach of surface.

Wounds are again classified as—

Incised when caused by clean cutting instruments;
Contused when accompanied by bruising;
Punctured when inflicted by pointed instruments;
Lacerated when accompanied by tearing;
Penetrating when the offending agent passes into and becomes lodged in the tissues;
Perforating when the agent passes into and through the body or limb.

Wounds are again divided into—

(*a.*) Those made through the normal skin which communicate with no mucous or other bacteria-invaded canals.

(*b.*) Those made through bacteria-invaded canals and which are in direct communication with them.

[1] Read at a meeting of the Midland Counties Veterinary Medical Association on August 8th, 1900.

Surgical Wounds.—I would first briefly refer to the difficulties under which we are compelled to work, as compared to the human surgeon.

In the character, temperament, intelligence, and surroundings of our patients are to be found the reason why a sterile wound is much less often seen in animals than in man; and not any want of common sense or skill, such as was accredited to the members of the veterinary profession by a self-elected critic, in the pages of a certain sporting paper a short time ago. I hope we are agreed that to attempt sterility in our wound cases should be the aim of all of us, and it is as to the most practicable way of acquiring this, in as many instances as possible, that I ask the benefit of your experience and opinions to-day, always remembering that the results of wound infection vary in proportion to the dose of poison received, and consequently that half a degree of asepsis or antisepsis is better than none at all.

In conducting an operation our first care is that of our instruments, which should always be disinfected by heat. An ordinary fish kettle answers the purpose very well, and is inexpensive, but a more elaborate appliance, which disinfects both the instruments and the dressings, I will show to you presently.

The instruments should be boiled for fifteen minutes in a 5 per cent. solution of carbolic acid; and should be transferred to a bowl containing a weaker solution of the acid prior to the operation. All needles, ligatures, knives, forceps, &c. should be included in the boiling process, and be taken from and replaced in the carbolic solution only by the operator or his trained assistant. It is only by being thorough that satisfactory results can be obtained. Sponges—which may be, and often are, a great source of infection—must also be boiled in the antiseptic solution, and afterwards treated in the same way as the instruments. Sponges that answer our purpose very well can be bought very cheaply, and when not in use should be kept in a covered jar of carbolic acid solution, which must be changed periodically to make up for evaporation. Under no circumstances should an ordinary unprepared sponge be used in the dressing of a wound; if this is done our antiseptic dressings will be largely thrown away, and we shall be taking away with one hand what we are giving with the other.

In an operation in which it is necessary to cast the patient, I find it a good plan to first cover the straw bed with a clean tarpaulin, which is stretched and pegged down over it. The next step is the preparation of the site to be operated on, which consists of washing the part thoroughly with soft soap, hot water, and a scrubbing brush, this particular soap being used because it has a larger disinfecting value than any other. As well as being washed the part should also be shaven, for I make it a rule always to remove the hair with a razor, irrespective of whether or not the wound can afterwards be kept aseptic, for the reason that it is impossible to disinfect the skin whilst the hairy covering remains upon it. Having scrubbed the naked skin until it is quite clean and free of grease, the same is disinfected with biniodide of mercury dissolved in methylated spirit 1 in 500. A water solution of the biniodide may be used, the agent being dissolved with an equal weight of potass. iodid., but a spirit solution is better, because it penetrates further and helps to remove the grease of the skin. Beneath the part to be operated on, towels rung out of carbolic acid solution should be placed, the object of this being to prevent dust rising from the

bed. The hands of the operator should be brushed with soft soap and hot water, well rinsed in the biniodide and spirit and left wet. In making the incision, taking up vessels, sponging or washing out the wound, the operator or his trained assistant takes the various appliances from the bowls of antiseptic solution which are held out to him, and replaces them as required, everything being immersed in the solution when not actually in use. The work of the knife being at an end, hæmorrhage is arrested by tying the leaking vessels (which have been secured by pressure forceps during the operation) with sterilised silk, after which the wound cavity is mopped out with damp aseptic sponges. To make quite certain of our ground, it is well then to douche the part with biniodide of chinosol solution, the apparatus used being an inexpensive syphon douche which I have here, the vessel containing the fluid being placed on a stool at a little distance from the patient.

In securing the surfaces of the wound the deeper layers may be stitched with sterilised silk or fishing gut, the first of which will be absorbed in due course and the second remained unabsorbed and harmless, providing the wound remains aseptic, failing which they should be removed. For securing the skin, the one material which in my experience surpasses all others, is silkworm or fishing gut. This can be obtained of any strength and in lengths each sufficient for one stitch; it has the advantages of being non-irritating, whilst fluids cannot pass along it, it may be boiled almost with impunity, is exceedingly tough, and contact with fluids only makes it stronger. Skin wounds should always be stitched with it, and it may be buried in an aseptic wound without fear.

The fixing of the skin sutures completes the operation, and we now have, or ought to have, a sterile wound, and it is at this point that our real difficulties commence. In the case of a wound on a limb or other part where bandages can be applied the matter is comparatively simple and the procedure as follows:—The neighbourhood of the wound and the line of stitches is powdered over with iodoform; over this are laid five or six layers of iodoform gauze, then a pad of Hartmann's sublimated wood wool, which is very absorbent, light, and inexpensive; this is covered with a thin sheet of rubber sufficient to well cover the dressings, and bandages applied over all. With regard to iodoform, no one seems to quite know how it acts. Many authorities have only a moderate opinion of its antiseptic properties, but everybody uses it, and in my experience it is the most admirable dressing which can be directly applied to the outside of a *fresh* wound, providing it is dusted over a large enough area to meet with any bacteria, which may sneak under the dressings, before they reach the wounded region. Please note that I say fresh wound, because it is not the best dressing for a stale wound. The antiseptic qualities of iodoform are supposed to be due to the free iodine which is disengaged from it, and which enters largely into its composition. The object of the gauze is to act as a sort of antiseptic filter to any bacteria which may be striving to reach the wound; the pad of wool fulfils the double duty of absorbing any fluids and also of exerting gentle and uniform pressure by which the edges of the injury are kept in apposition, and strain on the sutures prevented; and the sheet of rubber is used to prevent the dressing becoming wetted from outside. In the case of a limb the wool and rubber may extend right round the leg; the former will prevent the bandages being applied too tightly.

The difficulties are much increased in those parts where no pressure can be exerted, and where it is not easy to retain the dressing in position. In operations on the thigh, quarters, abdomen, shoulder, neck and head, or in any region where bandages cannot be applied, the dressing, if possible, should be held in position with strips of strongly adhesive plaster, which should have a certain amount of elasticity to accommodate itself to the animal's movements, and supported by a made bandage cut to fit the part. This answers very well in a small or shallow wound, but where the injury is large and deep it is necessary to provide for drainage in the absence of pressure. It will be seen that the effect of moderate pressure is to keep the severed surfaces in apposition and so prevent the formation of a cavity by the exudation of fluid, so that in these cases where no pressure can be used drainage must be provided by inserting a drainage tube, which should be removed in a day or two. In operations on and about the foot, which it is next to impossible thoroughly to disinfect, I make it a rule, after removing the shoe and rasping and paring the outer covering of the hoof, to immerse the foot for several hours before operating in a 5 per cent. solution of creolin, having first well scrubbed the neighbourhood with soft soap and hot water; after the foot leaves the bath, and before it is allowed to touch the ground, it is enveloped in a strong rubber bag, which is removed immediately before it is finally disinfected. Again, in operations of the nose, eyelids, ears, or other small and constantly moveable parts, the line of stitches is painted over with collodion, on to which iodoform is dusted before the agent is dry, a little cotton-wool being incorporated with the collodion to add strength, and form a sort of aseptic scab. I will conclude this part of my paper by saying that to get the best results the animal in nearly all cases should be cast and chloroformed, as otherwise the struggles of the patient are sure to upset something, or cause dust or dirt to settle on the wound.

Accidental Wounds.—Accidental wounds in veterinary subjects are generally stale and invariably dirty when we are called upon to treat them. They may have existed from a few hours to several days before our services are sought and usually have had applied to them some so-called "dressing," which they would have been infinitely better without. The average owner of a wounded horse seems to think that no time should be lost in fomenting the part with a flannel and hot or cold water, the former often being the first thing of its kind which comes to hand, and the latter frequently contained in a dirty bucket. This finished, the injury is plastered over with black, green, yellow, pink, or white oils as they are termed, after which the veterinary surgeon is, or is not, sent for, in accordance with the amount of confidence reposed in the oily mixture, which is credited with great healing properties. As a result of this treatment the practitioner frequently finds that he is unable to stitch the injury, the edges of which are stiff and contracted, the part is inflamed, painful, and swollen, and often emits a putrid odour. In my opinion, the veterinary surgeon stitches far too many accidental wounds. They look very nice for a day or two when neatly sutured, but he knows that the holes made by the stitches will generally suppurate at the end of that time, and that the sutures will then commence to cut themselves out, leaving scars more noticable than the original injury. Knowing this he continues their use in most cases in which the edges can be brought together, for the reason, I am afraid, that it satisfies the owner, and looks well when newly done. This treatment, in my opinion, is

generally wrong in cases in which the injury has been improperly treated, and where the deeper layers of it contain septic matter or dirt. If you can guarantee to effectually cleanse the wound of all harmful or septic material before stitching, then stitch by all means, but it is almost impossible to do this in a stale or impure wound. Of course the skin must be preserved as far as possible, and when hanging in flaps should be joined directly to the part from which it has been torn; but in deep wounds an opening should at least be left top and bottom to provide for efficient douching and drainage,—in fact the deeper layers are much better left apart in order that each and every portion may come in contact with the irrigation fluids. A paper was read some time ago by an eminent member of our profession in which the writer is reported to have said that he approved the employment of sutures, providing they were removed in forty-eight hours. I confess to a feeling of astonishment at an opinion of this kind, and I fail to see what useful purpose can be served by so unusual a proceeding. The essayist declared, if I quote him correctly, that the wound would eventually heal in the position to which it had been drawn by the stitches, although it might recede to its original position when the sutures were removed. Unless the wound is unnecessarily stitched to commence with, and is afterwards opened to give exit to and allow disinfection of that which ought never to have been imprisoned, I cannot see any sound grounds for this practice.

To disinfect a stale septic wound several courses are open to us, the first of which is to thoroughly wash and brush the part with soap and hot water. The connective and muscular tissue may be torn and bruised, and have incorporated with them dust, dirt, grit, &c., which no amount of washing will get rid of. How then are we to attempt to render this harmless, and in what way are we to attack the infection which has taken or is taking place. There are one or two ways in which this may be done. The wound may be scraped and painted with pure carbolic acid, or with solution of chloride of zinc, 40 grains to the ounce; this latter being the plan adopted by Lord Lister, which he called "pickling" the wound; it may be rubbed over with pure chinosol powder or it may be continuously irrigated with antiseptic fluids. The painting process is the quickest, most certain and thorough, but it is also a good deal the most irritating. A good deal of pain and inflammation follows; the formation of granulation tissue is retarded. The latter is a serious disadvantage, for the reason that bacteria and other products can only permeate granulation tissue with the greatest difficulty, so that our aim—especially in wounds which offer a large area for absorption, or which are in the region of joints or other important structures—should be to promote granulation with all speed, and so close the door against bacterial invasion.

I always employ the syphon douche, and commence with a 3 per cent. solution of creolin. The fluid must be tepid, and in severe injuries should be almost continuously used until a granulating surface appears. I don't worry myself about the character of the granulations so long as I get them quickly, and whether they are œdematous or not matters very little, because their nature can be easily altered by the application afterwards of suitable agents, such as chloride of zinc solution when they are swollen and tender, or nitrate of silver if too prolific. Creolin of suitable strength appears to have an extraordinary effect in promoting granulations, the 3 per cent. solution being diluted after a few hours' use. A bucket containing the

fluid is hung on the wall, the bottom of the vessel being above the part to be irrigated, the nozzle of the douche being fixed in the upper or deeper part of the wound as circumstances dictate, and the attendant instructed to replenish the bucket as required, and to refix the nozzle in position if this becomes displaced. In accordance with the extent and condition of the injury the solution is allowed to trickle through or over it for from several hours to a few days, the current being occasionally stopped for a short time if employed over a long period.

Much harm may result from the *continuous* use of *cold* applications to a wounded or inflamed structure. Cold fluids should never be employed for more than twenty minutes at one time, because the effect is to gradually contract the vessels of the part until they reach their smallest diameter, and if the cold be applied after this stage the vessels become paralysed, reaction sets in, and congestion and blood stasis result.

With regard to wounds involving joints, bursæ, tendon sheaths, and similar important structures, as example we may take a badly broken knee, a punctured wound of the hock, and an over-reach involving the flexor tendons.

A badly lacerated knee, accompanied by escape of synovia, demands in my experience heroic treatment, and generally gets it. Of all wounds this one usually contains the greatest amount of grit and gravel, which is incorporated with the torn fibres of the tissues, and embedded in every hole and corner of the laceration. No amount of washing or syringing will dislodge it, and it must therefore be rendered harmless as far as possible *in situ*. I treat these injuries by washing with soap and water, and afterwards plugging every corner of the wound with chinosol tablets, which I push right into every part, and force into the bottom of the wound when I suspect the joint is injured. I then cover the knee, the skin of which has been shaven and disinfected, with several layers of gauze, a pad of sal. Alembroth wool, a layer of thin rubber and a neatly applied bandage. The animal's head is tied up and the dressings allowed to remain untouched for several days. When the wound is next dressed it looks as though it had been filled with flakes of chocolate, but there is no pus, and usually very little synovia. If there is a large coagulum of the latter the wound is again plugged as before, a knee split applied at the back, and the dressings allowed to remain for from four days to a week without further removal. A dose of physic should be given in this as in all other important wounds; the temperature should be taken occasionally, but the dressings should not be unnecessarily interfered with, especially if it is seen on first removing them that they might have been allowed to remain longer. With this treatment I have had some remarkable recoveries in cases in which it appeared almost hopeless to attempt to restore the usefulness of the joint. I have never seen any ill effects from the use of undiluted pure chinosol in a stale or contaminated wound, and it appears to cause only a slight and temporary burning sensation. When the flow of synovia has ceased the dressings should be changed in accordance with the character of the young reparative material.

With open hock joint the treatment which I adopt is the same; the pure chinosol tablets being pushed well into the punture and an outside dressing applied with due regard to skin disinfection. Some practitioners recommend the use of shellac collodion painted over oiled silk in such cases without any regard to antisepsis or disinfection. I do not agree with

this treatment, because I believe that the chief danger of open joints lies in their extreme liability to infection, wherefore it seems the more reasonable to aid the healing process by disinfecting the wound cavity, than by blocking in the septic discharges and so favouring suppuration and other evils.

Now, a word as to the treatment of sinuses and fistulæ, which are so often met with in veterinary practice, and which have an evil notoriety which, in my opinion, they ought not to possess. The terms sinus and fistula are often confounded.

Sinus (literally a gulf) should be used to describe an enclosed canal wherein pus collects, and having a small orifice and little or no tendency to heal.

Fistula is a pipe connecting the skin with a mucous membrane, and is prevented from healing by the passage through it of saliva, fæces, urine, or other secretions.

We have sinus of the poll, withers, coronet, &c., and fistula of the salivary duct: it is incorrect to speak of fistula of the withers or poll.

Sinus of the withers or poll is caused first by a collection of pus which, being unable to find an exit, burrows and collects in the tissues, forming pockets and cavities in all directions. The pus is liberated, but too often the incision is made without due regard to bottom drainage, though it is occasionally anatomically impossible to obtain this. Unless the wound can drain from its very lowest part the pus will continue to burrow, and by separating the soft from the hard tissues fresh sinuses will be formed, and will be prevented from healing by want of drainage, by the movements of the part, by the cloud of organisms which infest the pipes and which are only prevented from entering the system by the granulating walls of the wound cavity. The treatment of a sinus, then, is to lay it open from end to end where its position allows this to be done, and in any case the incision must extend as close to the bottom as possible. This done, the granulations must be scraped away in order to get rid of the septic matter which is clinging to them, and which is causing irritation and pus. The scraped surface is then disinfected by rubbing in chinosol powder or by painting with carbolic acid or strong chloride of zinc solution, whereby the further formation of pus is stopped. The wound, when practicable, should then be continuously irrigated with the syphon douche and creolin lotion for several hours, in order to remove débris and encourage the growth of new and uncontaminated granulation tissue, and finally the wound should be plugged with gauze saturated in iodoform emulsion and left open; the dressings being kept from falling out by means of strips of adhesive plaster or in any other practicable way.

Sinus of the coronet, or quittor, is treated in the same way, a probe being inserted to ascertain the depth and direction of the canal and a V-shaped piece removed from the hoof wall until the end of the sinus is reached, after which the canal is scraped and disinfected, plugged with iodoform, covered with a pad of wool, a piece of mackintosh, and bandaged, the hair having been removed from the part, and the foot and lower limb disinfected before the operation.

I think, gentlemen, that I have now touched upon as many phases of my subject as time will permit, and in drawing my essay to a close I would like again to say that the character of our patients so handicaps us in our attempts to practice modern wound treatment, as often to make them only

partially successful and therefore somewhat disheartening, especially as the methods require a considerable expenditure of time and patience. Against this, however, we have the knowledge that, as the results of wound infection depend upon the quantity and kind of pathogenic organisms received into them, half a degree of asepticism is better than no asepticism at all. In treating each and every wound our object should be to keep the injury free from organisms by every means we can devise, and it is our duty to use every endeavour to improve the methods whereby this can be attained. Our failures to do this completely will, with our present knowledge, be far more numerous than our successes, but we shall never fail to secure a large part of that, the whole of which is not yet within our reach.

In conclusion, I thank you, Mr. President and Gentlemen, for the attentive hearing you have so kindly given to my attempt to lay this subject before you in a concise and practical light; and I trust that any defects in my handling of the subject which may be apparent to your critical minds will be counter-balanced by the value of the discussion such as I hope it may be in the good future of this essay to promote.

At the close of the paper, Mr. Spencer exhibited a portable apparatus for sterilising instruments. It was both compact and ingenious, and was generally admired.

THE GARTON LECTURES ON COLONIAL AND INDIAN AGRICULTURE IN EDINBURGH UNIVERSITY.[1]

BY ROBERT WALLACE, PROFESSOR OF AGRICULTURE AND RURAL ECONOMY.

THE expiring century seems an auspicious occasion for the new departure which has been made by the establishment and liberal endowment by Mr. Robert and Mr. John Garton, of Newton-le-Willows, Lancashire, of a course of about fifty lectures on "Colonial and Indian Agriculture," which are to be initiated in the current month in connection with the Chair of Agriculture and Rural Economy in Edinburgh University. The first half of the course, which will be delivered by the Professor of Agriculture before the end of December, will be inaugurated on October 18 by an address on "Famine in India," a subject likely to prove of peculiar interest, at what, let us hope, may be the closing epoch of the most prolonged, if not the most disastrous, of the recurring trials of physical endurance from starvation to which our Indian peoples have been periodically subjected. The ordinary work of the class will begin with a general view of the agriculture of India, including the main features of the Presidencies and other great political divisions, with special reference to geology, soil, climate, peoples, and chief products. The splendid suitability of the numerous native tillage implements will then be discussed, and their superiority over European implements pointed out, when local circumstances are fully considered. The section on cultivation of crops will deal with the native methods of rotation and the growing of "mixed" crops, the tillage, sowing, harvesting, and preparation for market, diseases, classification, and the production of the plants common to India, and specially the valuable grasses of India. Interesting references will be made to the Government grass and dairy farms at Allahabad and other military stations in Northern

[1] Extracts from a contribution to *The Imperial and Asiatic Quarterly Review* for October 1900.

India. Irrigation will be dealt with from the points of view of the land and other conditions suitable and unsuitable for the purpose; the relative advantages of canal, well, and tank irrigation; the quantities of water required, and the inexpensive native methods of lifting it. A description of native practices in supplying manure, and the various materials employed, follow, and the Indian section will conclude by a discussion of the points and characteristics of the various breeds of zebu or humped cattle, buffaloes, horses, and mules, goats, and sheep, with mention of the diseases common to the domesticated animals of the country.

The third and last division of the first section of the new course deals most appropriately this year with South Africa. Under the heading of Political Divisions, Cape Colony, Natal, the Transvaal, Orange River Colony, and Rhodesia will be briefly described, and their chief orographical and land-surface features pointed out. The population, consisting of British, Dutch, and other white nationalities, as well as the black races, along with labour and wages, will be discussed. The chief crops enumerated, viz., wheat, barley, oats, mealies (maize), millet, lucerne, sugar-cane, potatoes, and root crops, will receive attention, without neglecting the questions of rotations, manures, and the possibilities of development by means of irrigation. Under viticulture and fruit-growing will come the production and exportation of grapes, oranges, and various tropical and semi-tropical fruits, and the wine industry. The subject of live stock will include the large wild game, antelopes, &c., as well as the ordinary species of domesticated animals and ostriches, while special reference will be made to the diseases known as horse-sickness, anthrax, rinderpest, red-water (Texas fever), and scab in sheep, all of which have led to serious pecuniary loss to South Africa. The consideration of the general prospects of South Africa as a country for immediate agricultural settlement will close the course for the present year.

The reader would doubtless like to know how it came about that funds were provided to create and permanently endow this unique link between Great Britain and her Colonial and Indian Empires. Many years ago the brothers Garton began their system of cross-fertilising crop plants which in Nature are self-fertilising. The patient and arduous labours of twenty years have resulted in the production of hundreds of grains and other plants, many of which have been already shown to be superior in certain important characteristics to any of their known cultivated prototypes. The artificial cross-fertilisation of grains had long been practised, and by a good many experimenters, without any very important results having been obtained, chiefly owing to the fact that these pioneers employed ordinary varieties for their purposes, and were contented with first crosses as final results. It has been reserved to the brothers Garton during the final twenty years of the expiring century to demonstrate the enormous economic value of such work, when dexterity, perseverance, and judgment are in combination. They have achieved success by collecting from all quarters of the globe, species and varieties of different genera, not only of cultivated plants, but also of allied weeds and worthless plants of great constitutional vigour, and, after many trials and many failures, mating skilfully selected pairs of these together as a first step. The crossing of pairs of the selected, though not necessarily the most promising, progeny, after it had been shown that they had assumed fixed types, formed a second step. Much greater variation resulted from the second or subsequent multiple crosses than from first

crosses. Nature's ordinary course of events was thrown into infinitely greater confusion in the later than in the first crosses, and in this, together with the skill exhibited in making useful selections, rested the Gartons' success. The great majority of the compound results were either sterile or worthless, but the comparatively speaking few prizes are vastly superior to anything that can be produced by a first cross.

The great scientific triumph was speedily followed by financial success, although only a few of many valuable results have yet been put on the market. The substantial endowment of the lectures has been given as a thank-offering to Science for the success attained, and Edinburgh University was chosen as the appropriate instrument by which to accomplish the object, because of the sympathy and encouragement which was extended from that quarter to the workers at an early stage of the experiments, when a cold and indifferent world, and even leading representatives of Science, declined to smile upon their efforts.

A REVIEW OF A REVIEW.

AT a recent sitting of the *Société Centrale de Médecine Vétérinaire* held in Paris, a report was read by the judges appointed to award the Paugoué Prize, a sum of £50 offered annually in France for the best treatise or treatises on veterinary subjects. M. Nocard, who spoke for the judges, said they had had under revision eleven treatises, all of great merit—so great, indeed, that the Commission which has the task of conferring the prize upon the most deserving candidate, found itself unable to follow its usual practice of deputing the work of revision to a single one of its members, but had actually to appoint six for that purpose, "no single member having sufficiently extensive knowledge to judge the papers as they ought to be judged." When we learn that the list of judges included names like Nocard, Weber, and Railliet, we need not be surprised if the various treatises are found to deal with some of the most profound and abstruse of veterinary questions. The judges recommended five of the eleven papers as being of such nearly equal merit that they demanded an equal share of the prize, whilst four others deserved honourable mention. M. Nocard says that the five treatises are all "remarkable for originality of conception, for the importance or subtlety of the researches which underlie them, and for the practical conclusions which result from them; each, had it been presented alone, would certainly have gained the prize." Such words coming from such a man constitute no mean praise, and they justify us in giving an outline of the papers.

Treatise No. 1, written by M. J. Pader, a veterinary officer in the French Artillery, has for its title "Filariosis of the Suspensory Ligament of the Pastern Joint in the Horse," and is divided into three parts, namely the history of the disease, study of the parasite, and study of the lesions and their consequences. The discovery of the parasite is usually attributed by writers on the subject—including M. Pader—to Dr. Bleiweis, of Vienna, but M. Nocard points out that the credit of first discovery is due to M. Rigot, a former professor at Alfort, and it is curious to note that in support of this contention M. Nocard quotes an article by M. Hugh Ferguson in the *Veterinarian* of 1838. Contributors to our English journals will thus

see that they have a fair prospect of immortality, however humble they may think themselves to be.

With regard to the parasite, it is well known that hitherto no one has succeeded in obtaining it entire, except in cases where it had its seat in loose conjunctive tissue. Not even has M. Pader managed to isolate it from the suspensory ligament of the pastern, but he has succeeded in getting fragments of considerable length and—what is more important for its study—occasionally corresponding to the anterior or posterior extremity. With the help of these he has made a complete zoological study of the parasite, and arrived at the conclusion that it is not a spiroptera but a true filaria, to which we must restore the name *Filaria reticulata* (Diesing), Creplin.

Treating of the troubles produced by the nematode, M. Pader applies, quite justly, the name filariosis. He has deliberately confined his researches to the suspensory ligament of the pastern, but he has made a minute and careful investigation of the lesions produced there by the parasite. Even with the naked eye he could observe a peculiar tumefaction of the ligament, cavities formed in its thickness, and sometimes true parasitary nodules. With the microscope he was able to trace the development of the lesions, and so to demonstrate the pathological consequences of the invasion of the ligament by the filariæ. He found that 80 per cent. of the horses, asses, and mules under his care or in his district (Nîmes) were affected by this filariosis, and asks whether an affection so common has not remained misinterpreted because it is supposed to be benign. His observations lead him to an opposite conclusion. He has ascertained in fact that a great number of the suspensory ligaments affected by this parasite are the seat of a thickening quite perceptible in the living animal, and without the least doubt looked upon, superficially, as a "distention" or a strain, although the most careful examination cannot trace, in the dead animal, any wound-lesion at the part. This is a warning to us to be very reserved in our diagnosis of tendon-congestion, and to reflect as to whether, in cases of genuine and confirmed sprain, the parasitary injury to the ligament is not often the beginning of its break-down. M. Pader goes still further, and from carefully collected statistics seeks to prove that filariosis of the suspensory ligament of the pastern is distinctly favourable to strain of the tendon and particularly to strain of the perforate. He also finds a relation of cause and effect between the parasitary injury to the ligament and hypertrophy of the corresponding tarsal or carpal frena.

Finally M. Pader discusses the question of the prophylaxy and treatment of this species of filariosis. At present we know nothing of the evolution of the *Filaria reticulata*, and it is therefore impossible to formulate prophylactic measures. All that we can say from our general knowledge of the migrations of the filiariæ is that the species under discussion must undergo, like its congeners, evolution accompanied by transmigration; probably it has, for intermediary host, some insect or rather some small fresh-water crustacean. But this surmise is too vague to be useful in protecting our horses from attack. As to treatment we are not much better off. Even admitting our diagnosis to be correct, we have no direct means of acting on the parasite. The principal outcome of the investigation is to show the necessity for extreme caution in diagnosis when we are confronted with tendon-thickenings. All veterinary surgeons have had occasion to note manifest and vexatious failures in the treatment of these lesions by

blistering or cauterisation. These failures may be due to the presence of the parasite, and when that is so we must avoid irritant treatment; even when the case is doubtful, says M. Pader, we ought to confine ourselves to douches, massage, and simple rest, without neglecting the mechanical means required for reducing tension of the ligament.

In the discussion which followed M. Nocard's reading of the paper, M. Paul Cagny stated that a long time ago he had used subcutaneous injections of essence of turpentine in place of blisters, and had been surprised at the rapid and permanent disappearance of lameness in two cases where a horse was under treatment. In one case especially, that of an overworked horse which had become very lame far down the leg, the tendons were very much strained, but fifteen days after the injection he was nearly all right again. These were probably cases of filariosis of the suspensory, and probably the essence had acted as an anti-parasitic.

(*To be continued.*)

Clinical Papers.

A CASTRATION CASE AND ITS SEQUEL.

BY JOHN CONNOCHIE, ESQ., M.R.C.V.S., AYTON.

BEFORE operating, a manual examination revealed the near side testicle to be very hard, enlarged, and round in shape. As the spermatic cord seemed normal in condition, the testicle was removed in the ordinary manner with the ecraseur. On making a section of the testicle there was only a slight trace of real gland structure, and embedded in its centre was a flat piece of bone and a tuft of hair. The bone was irregular in shape and about an inch square. This, of itself, I believe, is nothing very unusual. Hæmorrhage from this side was very persistent, and finally the scrotum had to be plugged with antiseptic wool. This was removed two days afterwards, and the colt seemed to do well enough, ultimately being sent to grass.

After being out about a month, he was observed one day showing colicky symptoms and brought in. With a little treatment this attack passed off, but for some reason or other he was not put out again—being kept in a shed on a changed diet. About a fortnight afterwards he again showed symptoms of abdominal pain and was treated as before. This time, however, the pain was more persistent, and, as a prominent symptom was the stretched-out position with voidance of small quantities of urine, an examination per rectum was made. This revealed a large hard mass in the left iliac region, but extending well into the pelvic cavity. Its exact size cannot be stated, as it was impossible to pass the hand either beyond or beneath it. From its intense hardness it was concluded that it was not an impacted colon, and the probability of it being a calculus was negatived by its immense size, irregular shape, and the fact of it being, beyond doubt, as it ultimately proved to be, outside the intestine altogether. From its position it could not fail to press upon the pelvic flexure of the colon, the floating colon, and the bladder, and as the constant pain was beginning to wear the colt out, it was evident he would have to be relieved, if possible, in some way, or pole-axed.

After a consultation with Mr. Lothian, of Duns, it was decided to try and puncture the tumour from the outside; he hazarding the suggestion that it *might* contain pus, while I half fancied it might be a cystic tumour with extra thick walls.

A long slender trocar was therefore inserted from underneath, through the floor of the abdomen, three inches to the left side of the front extremity of the scrotum, and in a slightly forward direction, so as to avoid the pubis. The tumour was struck on the first attempt, but the trocar seemed to bury itself in a solid mass, and it was not until it was pierced in a slightly different part for the third time that it (the trocar) got home and pus flowed through the canula.

The latter being of rather small calibre, a much larger one was introduced, and pus flowed copiously off and on for nearly twenty-four hours. It sometimes stopped for a time, but a change of position set it going again.

As extensive œdema was produced by the puncturing and presence of the canula; the latter was withdrawn after a large piece of drainage tube had been inserted and stitched to the skin to prevent it falling out. This also was removed seven days afterwards and the opening allowed to close, but it kept patent for some time.

From the moment of puncturing the abdominal pain became less acute, and ultimately disappeared, although the colt was very stiff until the drainage tube was removed.

He commenced to feed well and took a few doses of iodide of potassium and sulphate of iron readily. Before going to grass again he was again examined, and although the tumour could still be felt, it was not half the size, and we are not without hope that it will ultimately become entirely absorbed.

PARALYSIS OF THE SUPRASCAPULAR NERVE, WITH SLIGHT RUPTURE OF THE TERES EXTERNUS MUSCLE.

BY W. M. OGILVY, ESQ., M.R.C.V.S., LONDON.

Anatomy.—The shoulder-joint, scapulo-humeral articulation, is formed by the glenoid cavity of the scapula and the articular head of the humerus. It is a ball and socket joint with one strong capsular ligament. The bones are held in position by the following muscles, which pass from the shoulder-blade to the arm:—the antea spinatus, postea spinatus, postea spinatus minor, subscapularis, and flexor brachii. The brachial plexus comprehends that large bundle of nerves formed of the inferior branches of the seventh and eighth cervical, the first and part of the second dorsal nerves, all of which converge to the interstice between the two divisions of the scalenus muscle, where they unite and pass outwards round the first rib. At and below the arm the plexus divides into numerous branches, distributed to the muscles and teguments of the anterior extremity (Strangeways). The suprascapular nerve, an important branch of the brachial plexus, takes its origin chiefly from the seventh cervical nerve, and passes between the antea spinatus and subscapularis muscles on to the lateral aspect of the shoulder to supply the two spinati and the teres muscles. It therefore supplies with motor twigs the above-named muscles, which form lateral ligaments to the shoulder (Möller).

A seven-year-old cab mare had been confined to the stable for a few days, and when taken out was very fresh. In the midst of the traffic she became very restive, rearing and plunging about and then suddenly swerving, struck her off shoulder with considerable violence against a wooden post protruding from a van. As a result of the collision, the mare became exceedingly lame on the injured limb, and was unable to walk without showing evident manifestations of pain. The infirmary ambulance, into which she required to be assisted, brought her to the yard. The mare backed out of the ambulance fairly well, placing a good deal of weight upon the unsound leg, and when led slowly across the yard the following symptoms revealed themselves:—The lame limb was carried forward with but little difficulty, and when the weight of the body was placed upon it, during the act of progression of the near fore leg, the shoulder-joint very distinctly bulged outwards, not in a quick jerking sort of manner, but more as a slow outward movement, just like as if the limb, having lost its capacity of possessing the power to support weight, "gave" at the shoulder. When the pressure of the body was transferred from the unsound to the sound leg, and consequently allowing the act of adduction to take place, the damaged shoulder nearly regained its normal appearance, except as regards the swollen look which it presented to the eye, and which was probably due to the effusion of serous fluid resulting from the contusion; in other words, the joint, after seemingly slipping out, partially slipped back again to its former position. Under the heading of "Shoulder-slip" (Williams' "Veterinary Surgery"), the following words lucidly describe this condition:—"There is a bulging outward, a contortion in fact, at every step the animal takes; the parts are thrown out of their equilibrium, first into a state of undue relaxation, by the upward pressure of the humerus, then of undue extension, by the outward bulging." This adduction of the scapulo-humeral articulation was very conspicuous when the animal was walked forward in a straight line, and was indicative that some grave injury was present, directly or indirectly, in those muscles of the afore-mentioned articulation, which play the part and perform the functions of active ligaments present in other joints. While standing at rest the region of the shoulder, apart from its puffed appearance, was bathed in a profusion of cold sweats, which were only locally in evidence, and on manipulating the damaged area the animal, although not evincing very perceptible signs of acute and severe pain, was yet rather restless, and when the limb was raised and adducted, a peculiar looseness was present in that portion of the leg extending from the shoulder to the elbow, the functions of the muscles being apparently temporarily repressed, manipulation at the same time giving rise to diffused twitchings in the superficial tissues of the affected parts. On close examination there was no sign of any wound or abrasion of the skin. The position of the leg during repose was inclined backwards, the knee was to a more or less extent in a state of flexion, the phalangeal joints slightly so, and with the foot bearing weight mainly at the toe, the limb under the circumstances appeared as if it were just a little too long. The mare was put in slings; fomentations, the application of an anodyne lotion, combined with the hypodermic injection of a suitable dose of morphia to allay constitutional disturbance, was, in the meantime, the line of treatment adopted. For the first few days no very great change took place as regards improvement, except it was observed that gradually more weight was beginning to be borne on the affected limb, the heel coming

closer in contact with the ground, and at times actually resting upon it; still the flexed and "dropped" appearance of the leg existed, and, moreover, on manipulating the shoulder with slight pressure just posterior to the joint, more pain was evident in a circular area at this particular place than was evident over the other extent of the shoulder, increased pressure causing the mare to flinch perceptibly. Fearing that, apart from the nervous lesion with its consequent cessation of muscular function, other injury was present beneath this limited part, and taking into consideration a certain amount of restlessness of the limb displayed by it being intermittently scraped and pawed on the ground, and the continued flexion of the leg, the diagnosis arrived at was—although after complete examination of the shoulder neither muscular damage nor injury to osseous tissue revealed itself, the natural fleshy condition of the part besides its abnormal swollen appearance rendering a true diagnosis extremely difficult, that there was a solution of continuity in one or other of those tissues; such a conclusion being based on (1) the pain evinced when manual pressure was put on the part; (2) the uneasiness and restlessness of the leg as shown to visual inspection. In order that the ability to repair this lesion should be rendered easier, the limb was placed as much as possible in a position most calculated to favour the reparative process, by means of a splint extending from the elbow to the heel. Results, however, did not justify the prolonged application of this support, for after the fourth day, uneasiness becoming more obviously increased, it was thought advisable to have the splint removed, and upon doing so the limb resumed its previous state of flexion. The duration of time from the occurrence of the accident would now be approaching fourteen days, and, as the owner was considering the item of expense for professional treatment, it was resolved, in order to give him a satisfactory answer as to the prognosis of the case, that an incision over the seat of localised pain should be made. The mare consequently was slowly lowered in the slings and when placed in a recumbent position chloroform was administered. Whilst under the influence of the anæsthetic, the skin, after having the hair shaved off around this circular area, cleansed, and all due antiseptic precautions adopted, was longitudinally incised to the extent of nearly three inches. The seat of the operation was directly posterior to the so-called point of the shoulder, the distance from which would be nearly a hand's-span. After incising the cutaneous covering, the scapula fascia was broken down with the aid of the fingers, and as soon as this membranous expansion of fibrous tissue was sufficiently lacerated, the finger exploring the underlying tissues suddenly discovered a rupture in one of the muscles. Subsequently, on more minute searching and examination, the torn muscle was pronounced to be the *teres externus*, the tear in which was confined to the belly, and extending in the direction of the fibres for nearly four inches; as far as the finger could judge, it did not enter for any depth into the body of the muscle. The lips were of a lacerated nature, shreds of muscular tissue being removed by the finger, which also extracted a small clot of blood in a slightly fibrinous condition. No other lesion could be detected. The orifice was syringed out, the wound sutured, and after the effect of the chloroform had passed off, the animal was assisted to her legs by means of the raising of the slings. The wound, it may be mentioned, did not heal in a very satisfactory manner, suppuration resulting, although suitable agents were freely employed to counteract the attack of microbic invasion,

and consequently limit as much as the surroundings would permit the formation of pus. The entrance of these pyogenic organisms was favoured, as above mentioned, by the environments, and their growth and further development stimulated by means of their finding within the wound pieces of broken-down tissue, which presented them with a most convenient soil. As a result, a small quantity of pus burrowed its way downward in the loose tissue towards the elbow, and although active syringing was periodically kept up, a collection of matter seemed to be always retained within the base of the wound. In order to overcome this difficulty, a piece of drainage tubing was inserted after making a depending orifice, and this, enabling the wound to get rid of the discharge and allowing of thorough injection of antiseptic fluids, sufficed, after being retained for a few days, to bring about in a short time absolute repair. Careful observation revealed the fact that as the process of repair was taking place in the wound the position of the limb at the same time was regaining its natural shape, the leg resuming a more upright appearance, until ultimately the foot became normally placed perpendicularly below the body, and moreover, the limb, instead of always being in an irritable, restless state, expressed by continual pawing on the ground, was now kept in a condition similar to that of its fellow—at rest. This interesting fact made it palpably evident that the continued restlessness evinced by the injured extremity must have been due to the detached pieces of muscular tissue which were extracted from the wound by means of the fingers and the active syringing, and that they being the cause of the constant irritation, when removed, the effect ceased. In explanation of the gradual disappearance of the flexed condition of the leg at the same time, and its resumption of that position which is associated with sound ness, it is very probable that the patient, on finding that less strain was thrown on the injured muscle when it retained the limb in this relaxed fashion, continued to keep it so, and that when the breach in the muscle became repaired by degrees, such a position of rest being no longer necessary, the extremity gradually resumed a more natural posture, as the reparative process restored the muscle, until ultimately, as afore-mentioned, the foot was placed perpendicularly below the body. Previous to the wound being entirely healed, a mild blister was applied around the region of the shoulder joint; the effect of this vesicant, when its irritative properties began to exert themselves, caused the animal to swing the leg violently forward, and during the intervals of rest to support a considerable amount of weight when its fellow was raised from the ground. After the irritation had ceased the mare "stood level," the weight of the body being equally distributed over all the four legs. A day or two after the application of the blister the mare was taken out of the slings and slowly walked across the yard; progression was not difficult, yet the shoulder bulged outwards during the act of walking, but not to such a considerable extent as at first manifested, and when the opposite sound leg was held up and retained in the elevated position for some time no inconvenience whatever was displayed. She was now walked back again to the loose box, her head tied up, the further use of the slings being dispensed with, and treated with local applications of cold water around the scapular region. Atrophy of the muscles, as a result of imperfect nutrition, was now becoming apparent. On either side of the scapular spine a slight depression was observable, the manifestation of the atrophic change, as far as the eye could detect, locating itself in the spinati muscles, the outline of

the spine being well marked out in comparison with that of its fellows. In order to check, if possible, the loss of muscular and nervous irritability, recourse was had experimentally to the electrical current. The effect of the first few shocks, however, made it clearly obvious that, instead of the electrical stimulus acting beneficially and bringing about recuperative properties in the region to which it was applied, the contrary was likely to be the case; as the patient, having a naturally nervous temperament, was thrown into a great state of excitement even when stimulating at first with a weak and gradually with a stronger stimulus, and, in consquence of this, its further use was withheld. The treatment which was now suggested for adoption, so that further wasting and emaciation of muscular tissue should be restrained, was that of repeated applications of mildly stimulating blisters with intervening periods of jets of cold water directed upon the shoulder. The curative powers of these remedial agents, however, were insufficient to repress the pathological change, and on withholding them for a time the atrophy became very rapid. Möller advocates massage in order "to check the progress of the already existing pathological changes in the nerve, and for the same purpose veratrin may from time to time be injected. For this purpose 1½ grains of veratrin (the variety insoluble in water) is rubbed down with about 75 m. of water without adding alcohol, and the mixture injected beneath the skin." Other authorities have seen good results from the subcutaneouu injections of Ol. Tereb., and from strychnine. In this case, however, the pathological change being so distinctive, the loss of muscular tissue becoming so pronounced, it is my opinion that the results likely to be obtained from these remedies, as local motor stimulants upon the terminal motor apparatus and others, by rousing the local circulation and metabolism as means of assisting and preserving muscular nutrition and activity, would not be such as would lead one to justify them in being employed as restorative and curative agents, the prognosis being very unfavourable. The mare being now incapable of doing the work in which she had previously been engaged, and, in fact, being unfit for even slow work, as the shoulder-joint still had a tendency to bulge outwards during walking, the owner was advised to have her destroyed. Unfortunately he had her removed while alive to a place some few miles out, and so the post-mortem examination which was intended to have taken place was unavoidably prevented, the results of which might have revealed some interesting facts regarding the actual cause of this loss of nervous irritability.

Extracts.

THE USE OF BROWN SEQUARD'S TESTICULAR FLUID IN VETERINARY PRACTICE.

BY M. LANGE, ASSIST. V.S., FRENCH ARMY, NOUMEA, NEW CALEDONIA.

THE communication which was presented to the Central Veterinary Medical Society of France was referred for examination by a committee composed of MM. Nocard, Chauveau, and Desoubry. The latter communicated his report to the Society at its meeting on 24th February 1898.

The experiments of M. Lange date back from 1894, and the subjects

comprise ten horses and three dogs. Certainly there are too few in number to give any definite data; but nevertheless they are sufficiently encouraging to hope that they will be continued.

M. Lange says that he was induced to use the testicular fluid from the favourable reports he had read about it in the medical papers.

Brown Sequard attributes to it two distinct actions: first, that it acts on the nervous system as a stimulant, and enables it to rectify the depressed condition of the diseased region; secondly, that the introduction of fluid introduced into the blood new material, which endows it with properties that enable it to counterbalance certain morbid conditions. Whichever may be correct of these hypothesis, testicular fluid has been used in the human being with success in derangement of the nerves, system debility, certain infectious and skin diseases, and rheumatism.

In the case of a horse six years old, a confirmed windsucker, and reduced to such an extreme degree of emaciation as to be useless for any purpose, M. Lange injected two doses of 20 cc. each at twenty-four hours interval. The animal worked as the shaft horse in a waggon. He performed the first day's march of 40 kilometres without distress or stumbling. The second day's march was the same length, and also was done at a foot's pace, without distress, and continued to do his regular work. Treatment was suspended on the termination of the manœuvres with the result that the horse rapidly lost condition. The injections were again used. The appetite returned, and the animal regained condition. Six weeks after, he was returned to his work. During the ensuing three months that he remained under M. Lange's observation he remained in good health and performed his regular work.

Another horse, fourteen years old, became partly paralysed in the hind quarters, and quite unable to work. From the 2d to 12th August 1894 he received a daily injection of 10 cc. of testicular fluid.

On the second day the appetite, which had not been good, returned. On the following, he was exercised for 24 to 36 kilometres, without any distress, and his improvement was so marked that M. Lange rode him himself from 13th August to 1st September, when he performed his work without any difficulty. The injections were left off, and relapse took place, but on renewal the symptoms disappeared.

The following case is quoted by M. Lange to show that testicular fluid not only acts as a stimulant in a state of debility, but that it exercises a power over nutrition and promotes cicatrisation of wounds in a remarkable manner.

A mare received a severe lacerated wound of the thigh, $1\frac{1}{4}$ deep by $3\frac{1}{2}$ inches long. Treatment was commenced the seventh day after the accident, and continued for eight days. The wound at once began to fill up, and twenty-five days after the accident the animal was cured. The author is of opinion that with ordinary treatment the case would have taken two months at least.

Two other cases are given, one in which the radial artery has been divided by a kick, the other in which the horn and sensitive sole had to be removed for a bad punctured wound injuring the navicular bone. The first was put to work 24 and the second in 25 days.

Another case is mentioned of an entire pony that got badly cut above the knee by the hoop of a cask. The animal was treated by the owner and neglected. M. Lange was called in 72 days after the accident and applied

the usual treatment, but without success. He then had recourse to testicular fluid. The day after the first injection the wound took on a healthy action and was completely cicatrised on the 24th day.

A fox-terrier, six months old, suffered from epilepsy and had been treated for tape-worm, of which a number were expelled without any beneficial result. Injections of testicular fluid were used for one month when the animal was returned to the owner. Six months later the dog was in good condition, and there had been no recurrence of the fits.

M. Lange makes the following remarks on the local and general phenomena that follow injection :—

Local.—There is always pain, which in the dog is manifested by whining and violently shaking himself, and in the horse by tossing the head up and down. Sometimes the horse *weaves* in his stall, and in every case it has been noticed that he opens his mouth and yawns, after which he shakes himself like a dog.

General.—There is general excitement, which is specially noticeable the day following the injection. The eye is bright and protruding, and the power for work and insensibility to fatigue are noticeable. The appetite is good, and urine and fæces are frequently passed. There is no alteration in the temperature.

M. Lange recommends a dose of 10 cc. for the horse and 2 to 2½ cc. for the dog. He also points out that the fluid itself must be pure, and the injection made with absolute antisepsis.

In the discussion that took place on the communication M. Megnin related a case that came under his notice in 1894 of a large wolf-hound, the property of a Russian residing in Paris, that had partly lost the use of the hind limbs for many months, was greatly emaciated, and almost entirely lost his coat. The animal had been treated in a variety of ways without success. M. Megnin suggested the use of the testicular fluid, which was attended with perfect success. The patient recovered the use of his limbs, recovered his condition, becoming fat and well, and the coat grew again. The dog remained in good health for several months when he was lost sight of.

(Translated from *Recueil de Médecine Vétérinaire*, 30th March 1898.)

JOSHUA A. NUNN, F.R.C.V.S.

EXPERIMENTS IN VACCINATION AGAINST TEXAS FEVER (TRISTEZA).

M. NOCARD, in a paper read before *La Société Centrale* on 12th July, said :—The Society is not unaware that the study of Texas fever has been one of the principal objects of the campaign that M. Lignières has just made in the Argentine Republic. A pamphlet published at Buenos Ayres gives an excellent account of the results of this study.

M. Lignières has shown that Texas fever is nothing but a manifestation of bovine malaria, that universal disease which Smith and Kilborne first described so well, and which has since appeared under many diverse names in every country in the world, except perhaps France and Central Europe. Texas fever is caused by an endoglobular hematozoon, the

bigeminous pyroplasm. It is propagated from diseased animals to sound animals by means of inoculation, and the agent of propagation is represented by young ticks produced from others which have gorged themselves with blood. The mortality is considerable, and very rarely does an adult animal resist a first attack; but this first attack confers an absolute immunity, capable of resisting the gravest causes of infection. The symptoms are identical—high fever, intense hemoglobinuria, the result of an unlikely globular destruction; in twenty-four or forty-eight hours the number of red globules may fall from 8,000,000 to less than 500,000 per cubic millimètre. Blood gathered from the point of entry gives a serum comparable only to gooseberry, or better still, to black currant syrup. At the autopsy the same lesions are found—the spleen large, soft, and black; liver and kidneys congested and softened; enormous gall bladder filled with thick and clotted bile; the bladder distended by a large quantity of urine, either red or of the colour of coffee grounds. The pamphlet of M. Lignières is filled with new facts concerning the etiology of the disease and the biology of the parasite. But one fact it does not state—it was published too soon—namely, that M. Lignières has succeeded in vaccinating against Texas fever. Before his departure from Buenos Ayres he made a large public experiment in the course of which several vaccinated animals were able to support without inconvenience the inoculation of a dose of virulent blood, which killed or made very ill all the other (unvaccinated) animals experimented upon.

This experiment had a considerable significance; it is the first time that any one has succeeded in inoculating against a hematozoic disease. M. Lignières is preparing to renew the experiment at Alfort as a favour to me. Two Breton bulls are being immunised, next Sunday they will be inoculated, along with a "fresh" bull of the same breed, with a deadly dose of virulent blood. In a few days the fresh bull will show the gravest symptoms of the disease, and will probably succumb; the two vaccinated animals will remain quite well.—*Recueil de Mêdecine Vêtérinaire.*

PROFESSOR KOCH ON THE RESULTS OF HIS MALARIA EXPEDITION.

BERLIN, *November* 17, 1900.

ON the 15th inst. Professor Robert Koch spoke to the Berlin and Charlotteburg section of the German Colonial Society on the results of the malaria expedition sent out by the German Empire. The meeting took place in the hall of the Kaiserhof (one of the biggest hotels in Berlin), and consisted largely of medical men, officials of the Colonial Department, and officers of the army and navy. Koch was received with loud applause. He began by thanking the Colonial Society for suggesting the malaria expedition, and then stated what is now known about malaria. The gist of his lecture was as follows:—

The germ of malaria, first seen by Laveran, is an animal organism which lives in the blood of the malaria patient, and is so characteristic that the discovery of even one such parasite in a person's blood justifies the opinion that he has malaria. There is a whole group of malaria parasites, and a corresponding group of malarial diseases. Germany has two kinds of malaria, Italy three, and a fourth kind, tropical malaria, is found in the

tropics. The parasite can live long in a human body. Malaria reveals itself in a series of attacks, each attack being the consequence of a fresh proliferation of germs. The violence of the attacks diminishes in the course of the disease, but relapses take place, sometimes even after the lapse of years.

The question how the parasites get into the blood used to be answered in several very different ways. Now it is known that they are borne from one human body to another by gnats. The discovery is due to an observation of Ross, who showed that the germs of malaria undergo a long process of development in the stomachs of gnats. The microscope shows that the developed germs meet in the poison gland of the gnat. When a gnat sucks a human being's blood, it empties its poison gland, and thus introduces the parasites into his blood. In August 1898 a German expedition was sent to Italy to test Ross' statements, and was soon able to confirm them. It was also ascertained that the apparently different Italian forms of malaria are really one, that Italian malaria is identical with tropical malaria, and that apart from quartan and tertian, which occur among ourselves, there is only one form of malaria, namely, tropical malaria.

In the spring of 1899 the German expedition went to Italy again, and took up its abode at Grosseto, in the Tuscan Marremmae. Spring was chosen, because it is in spring that malaria breaks out afresh in Italy. At first there were few cases, and these were relapses of cases of the year before. Not till the weather became warmer did the first fresh cases occur, but then their number increased very rapidly. They were uncommonly severe, too, but the patients were taken to the hospital so promptly that the systematic treatment with quinine could begin at once, and consequently the number of deaths was comparatively small. In autumn, after raging for four months, the malaria died out. Now, why is it that no fresh cases of malaria occur in Italy in winter, though there are gnats there in winter, too? The reason is that the real home of malaria germs is the body of a malaria patient; they winter there. But the human body is not only the real home of malaria parasites, it is also their only home. In the blood of monkeys, birds, and bats, indeed, organisms strongly resembling malaria parasites are found, but closer examination shows that they differ from them. That the malaria parasite thrives only in the human body is also proved by the fact that malaria is not transferable to anthropomorphous apes. The way in which malaria is propagated is this:—A human being with malaria parasites is stung by a gnat, which thus imbibes malaria germs, which then develop in it, and are introduced into the blood of another person, whom it stings. The anopheles is the chief bearer of malaria parasites, but it is probable that other kinds of gnats (the pulex, for instance) play a part in the business. It follows that in the battle with malaria the point of attack must be the malaria patient.

The expedition then went to Java; from there to New Guinea. Notwithstanding the great resemblance between the physical and biological conditions of these two islands, they differ most strikingly. Wherever you go in Java you see the results of prosperous labour; in New Guinea hardly a trace of it. But the history of Java teaches that New Guinea, too, may be made to blossom like the rose. All that is necessary is the proper colonisation of the country, and the only hindrance (but it is a most formidable one) is malaria, which sweeps away men, women, and children. One most important hint for the combating of malaria is furnished by the discovery made by the expedition in New Guinea, that malaria is at bottom a

children's disease. If you examine the children at a place where malaria is epidemic, you find every one of them under the age of two suffering from malaria. In the older children, up to the age of ten, malaria parasites are found, but not so frequently. The best way to ascertain whether a place has malaria is to examine the children. This method was employed in New Guinea and in the neighbouring islands, and it was found that there is only one point on the coast free of malaria, and that some of the islands are free, others not. The combating of malaria must begin with the children, but it is also of paramount importance to attack all mild or latent cases. Thc latent cases play the same part in the combating of malaria as in the combating of cholera.

That this is not mere theory was signally proved by a practical experiment made by the expedition on the plantation at Stephansort. Of the 700 inhabitants, 137 were ill of malaria, and all but a few isolated cases were cured. Special attention was paid to all new-born and newly arrived children. These children remained in good health, whereas till then it had been impossible at Stephansort to keep children alive. The experiment which succeeded there on a small scale will succeed elsewhere on a large. The great decrease of malaria in Germany is significant in this connection. The draining of the swamps alone does not explain it. Gnats, and in particular the various kinds of anopheles, are everywhere to be found. The real reason is that quinine has become accessible even to the lower classes. In the marshy lands in the north-west of Germany everybody has quinine in his house. Thirty years ago a doctor had to think twice before prescribing quinine for a poor patient. The dying out of malaria in Germany is strikingly proved by the statistics of the German Army. In 1869 the number of malaria cases in the army was 13,500, in 1879, 9000, in 1889, 1500, and in 1896, 230.

How is it with other proposals for the combating of malaria? One of them is to annihilate the gnats. Here and there perhaps this may be done by pouring petroleum into swamps, but on a great scale it is impracticable. Another proposal is to protect people against gnats by means of ethereal oils; but the effect of such oils lasts only for a short time. Another means of protection is the mosquito net; but such nets are seldom worn after sunset, and they often let mosquitoes through. The mosquito-proof house is open to similar objections. All attempts to confer immunity from malaria have hitherto failed. The prophylactic treatment with quinine, on the other hand, is of value, but it cannot be carried out generally and long.

How, then, is malaria to be combated in our Colonies? We must send out medical men trained to work with the microscope, and follow the example of the Dutch Colonial Administration in giving the people quinine gratis. The first thing to be done is to send some medical men, especially to New Guinea and South-West Africa, as malaria doctors. This measure, based on the new knowledge we have gained of the manner in which malaria spreads, would afford the prospect of our getting the upper hand of malaria ere very long in the Colonies, which is the preliminary condition of their prosperity.

Professor Koch's lecture was received with loud applause, and Professor Gerhardt (one of the medical luminaries of Berlin) delivered a short speech, in which he lauded Koch as an investigator who not only brings new facts to light, but also teaches us how to turn them to practical account.

(*Scotsman, November* 1900.)

REPORT ON SURRA DISEASE IN HORSES.

BY ALFRED LINGARD, M.B., C.M.,

Professor of Bacteriology and Comparative Pathology, Civil Veterinary Department, India.

WE have received two volumes of this Report, containing an enormous mass of information in connection with this disease, and we here quote some parts of it which will be of interest to many of our readers.

DIAGNOSIS.

In order to diagnose Horse Surra, it was stated[1] that "the demonstration of the *Trypanosoma* will distinguish the disease from all other febrile maladies, and in order to exclude the possibility of any cases presenting dubious symptoms being those of Surra, it will be necessary to carefully examine microscopically several cover-glass specimens of the blood of the suspected animal for a period of ten days."

During the four years which have elapsed since the above was written, experience has taught one that this is the all-important principle to rely upon when a diagnosis is required.

The following instance will serve as an example of the difficulty of making a diagnosis in some cases. On December 4th, 1893, a horse in fairly good condition was received at the Laboratory Hospital in Poona, which was thought might be the subject of Surra. Several cover-glass preparations of the blood of this animal were daily examined microscopically from the 4th to the 12th of the month, both days inclusive, a period of nine days, but no hæmatozoa were discovered. On the evening of the latter date, the animal succumbed somewhat suddenly, and in order to make the diagnosis of the disease sure, two healthy guinea-pigs were each inoculated with 0·3 c.c. of blood taken from the heart of the horse one hour after death. The blood of inoculated small animals was subjected to daily examination, and on the ninth and tenth days after inoculation the Surra hæmatozoon was discovered in each case respectively, clearly proving that the horse had been the subject of Surra.

On the other hand, one might quote instances in which gentlemen have been so sure that their horses have been the victims of this disease that they have disagreed with the diagnosis of the Veterinary Officer in charge, and requested him to destroy their animals. On that officer refusing to do so, on the plea that the disease was not caused by *Trypanosoma Evansi*, the owners have then informed him that if he could cure the horses he might keep them as his own property. This he agreed to, and cured them. Now, this form of disease is characterised in equines by symptoms very much resembling those found in an advanced stage of Surra:—yellowness of the visible mucous membrances, conjunctival petechiæ accompanied with rapid loss in condition and the occurrence of relapses.

Animals suffering from these manifestations—a form of so-called *bilious fever*, caused by the presence in the system of an entirely different species of organism to the flagellated protozoon—when carefully treated, frequently, or, more correctly speaking, in the majority of cases, recover; whereas Surra is an absolutely fatal disease. So here again a certain diagnosis cannot be made without the use of the microscope.

[1] Vol. I., Surra Report.

Several other diseases from which horses suffer in this country are accompanied by petechiæ involving the conjunctivæ, during the course of the malady. As a rule, however, these extravasations of blood are small, and of a bright red colour, differing considerably from the extensive ecchymoses, for the most part involving the *membrana nictitans*, observed in Surra patients. These latter present a varying display of colours, especially when the visible mucous membranes are at the same time bile-stained.

There is one symptom in Surra animals which has been insisted upon by all observers and writers on this disease, namely, a *ravenous appetite*. A desire for food usually ceases with the supervention of fever in the horse, but this disease is an extraordinary exception to the rule. My remark in 1893 was to the effect that "in most cases from the very onset of the disease until death, which may occur weeks or even months later, the animal may never cease to eat all the food placed before it, and in numerous cases under my own observation the bedding has been devoured during the hours of the night, the temperature at the time being 41·2° C. (106·1° F.), or even as high as 42° C. (107·6° F.)." Evans remarks: "Some cases at last drop down, and die suddenly, perhaps when they are eating and enjoying their food, . . . while other cases linger for days after they are down, too weak to rise or to stand after they are helped up, but go on eating all the grass they get and much of the corn until they die." Again Steele remarks: "The appetite is excessive throughout the attack; it is remarkable how the animal in a state of semi-coma will continue to eat grass almost without ceasing. . . . Some patients stand and feed to the very last, and then drop dead."

Exceptions to this rule, however, must occur, for in September 1896, the water-famine year, I was asked to investigate a new disease which was carrying off a number of horses belonging to the Rohilkhund and Kamaon Railway Company, the most marked symptoms of which were *loss* of appetite, fever, emaciation, &c. On remarking that it must be the old disease the animals were succumbing to, for it was then September, the height of the Surra season in that part of India, I was definitely informed by the superintendent, a man with forty years' experience of horses in this country, that the malady from which the animals suffered was a totally new disease; the reason assigned being that the first symptom noted was loss of appetite followed by fever; "every one knew that a Surra horse never left off feeding, but that his appetite increased rather than diminished as the disease progressed." Within a period of twenty-four hours after my arrival, the blood of all the horses on the Dák line had been examined microscopically, and thirty-three found to contain the Surra hæmatozoon in varying numbers. Out of a total of 101 horses, 92 succumbed to Surra. From the instance above cited it will be seen that occasionally *Anorexia* may be a marked symptom of this disease instead of the ravenous appetite frequently observed.

NOTES FOR GUIDANCE IN THE TREATMENT OF SURRA IN EQUINES.

Only animals in good or in fairly good condition are suitable to undergo treatment for Surra. It will be found impracticable to attempt to cure ill-preserved animals—such as Tonga ponies—towards the end of a heavy and hard-worked season.

2. It is of the utmost importance for the successful treatment of Surra that the disease be recognised, and the animal subjected to the drug with the least possible delay.

3. The weight of the animal should be ascertained frequently when practicable, so that the maximum dose of arsenic to be administered during the treatment may be regulated.

4. Arsenic should be given in the form of liquor arsenicalis (Fowler's solution).

Arsenious acid (in powder),	. .	87 grains.
Carbonate of potassium,	. .	87 „

add half a pint of distilled water to these in a flask, and heat till dissolved: cool and add [1] compound tincture of lavender 5 drachms, distilled water sufficient to make one pint.

5. In most cases of Surra in equines a dose of five grains (5 grs.) may be commenced with, and given twice daily for forty-eight (48) hours, the quantity being increased by half a grain after every four (4) doses have been administered, until seven (7) grains are reached. The latter amount should be continued twice daily for seven (7) days in the case of an animal below eight hundred (800) pounds in weight, but in Australians of one thousand (1000) pounds in weight and upwards the dose may be increased by the addition of half a grain up to nine (9) or even ten (10) grains twice daily for the same period. The dose should then be gradually reduced by half a grain or one grain, according to the condition of the patient, until a four (4) grain dose has been reached. Again, if possible, after a period of two days, repeat the treatment, increasing and decreasing the dose of arsenic as above described. But the fact must never be lost sight of that, if arsenic be administered to an animal for a prolonged period, symptoms of gastric irritation will supervene sooner or later. It has been found that by giving [2] *kaunji* to the animal, morning and evening directly after the medicine, the above-mentioned symptoms have not made their appearance, consequently it would be advisable to give kaunji to the animals from the commencement of the arsenical treatment.

6. Daily microscopic observations of the blood should be made, and the number of organisms recorded on a chart for ready reference, together with the temperature, pulse, and respirations of the patient, which should be taken three times daily, viz., 8 A.M., 1 P.M., and 5 P.M.

7. Most animals will take the drug in one to two pints of water from a bucket without any trouble. If this be found occasionally impracticable, the arsenic can be mixed with the corn and bran in the form of liquor arsenicalis; but in obstinate cases the medicine will have to be administered to the animal in the form of a bolus or in a draught.

8. Acute desquamative nephritis is a common complication of Surra, but it must not contra-indicate the administration of arsenic, although the maximum doses cannot be maintained, otherwise the animal will have a relapse, and ultimately succumb to the disease.

9. Animals suffering from Surra, as a general rule, have voracious appetites. It has been found by practical experience that the following

[1] The compound tincture of lavender may be omitted, but the animals under treatment take the medicine more readily when it is present.

[2] Linseed, rice—ā ā ½ lb. Add water a sufficiency. Boil for ¾th hour and give when cool.

amounts of hay, corn, &c. are necessary for an Australian horse weighing 1000 lbs. and over, for on this the animal keeps in fair condition, and during convalescence puts on flesh rapidly :—

Hay, 15 to 20 lbs. Lucerne (fresh), 10 lbs. [1]Barley, 8 to 14 lbs. or Gram, 6 to 10 lbs. Bran, 1½ to 3 lbs. Salt, 1½ ounces.	Daily.

10. When once the organism of Surra has vanished for some days from the circulation of the animal under treatment, gentle exercise, commencing with five hundred (500) yards, and gradually increasing to one mile, morning and evening, may be allowed. But if the temperature becomes elevated, all exercise must be stopped until the former again registers within normal limits.

11. The exudation of semi-solid material (œdema) into the subcutaneous tissues, notably that of the lower extremities, sheath, and under-surface of the abdomen, generally becomes absorbed after a time under the influence of arsenic and exercise, but this may be accelerated by daily "massage" of the body and limbs.

12. Surra horses, under treatment with arsenic for long periods, and which eventually die, at their autopsies frequently present some atrophy of the spleen. Consequently subcutaneous injections of infusion of spleens have been made in order to ascertain whether the material injected would perform the function of the atrophied organ. Encouraging results have been obtained.

13. Certain of the horse Surra cases under treatment somewhat suddenly developed symptoms of chronic arsenical poisoning. These, which include partial loss of power over the hind quarters, crossing of the hind limbs when walking, and general unsteadiness and nervous tremors, usually proved fatal within forty-eight hours, although the further administration of the drug was immediately discontinued on their recognition. In some of the later cases under our treatment these fatal symptoms have been successfully combated by the subcutaneous injection of infusions of spleen and testicle (sheep).

14. The question with regard to the administration of arsenic to animals at the commencement of the rains, as a preventive, in districts where Surra is epizootic, is one worthy of trial. A dose of five grains of arsenic in the form of liquor arsenicalis (ten drachms) given once a day in the drinking water to each animal, could not fail to produce a beneficial effect, and could with safety be continued for a month at a time. The dose of arsenic should then be gradually reduced every three days by half a grain at a time until it is discontinued altogether. An interval of seven days should then be allowed to elapse, and again the same process persevered in with intervals until the termination of the rains, or end of October.

REMARKS ON PREVENTION AND LEGISLATION.

As it is recognised that Surra may be propagated in animals by means of drinking water, fodder, rat excrement mixed with corn, and the bite of

[1] Boil half the daily quantity given to the animal morning and evening with half the amount of salt for 1½ hours, then mix with the bran, and give when nearly cold.

certain kinds of flies, the following rules for guidance were drawn up some years ago (1894), and owners of dâk animals in certain Surra localities were informed of the best means of trying to protect their animals from acquiring the contagium.

The following are the most important :—

(i.) All water for drinking purposes should be boiled, when possible, from June to October inclusive, before being given to the animals at stations in districts infected with Surra.

(ii.) Hay should be made in cold weather (October to January), and stacked for the use of animals during the rains. The hay to be obtained from uplands, or from land not subjected to inundation, or better still from land entirely beyond the affected area. Green food should, during the rainy season, be prohibited, unless it is brought from without the surra area.

(iii.) All gram and corn to be screened and cleaned before being given as food.

(iv.) The use of the bel (creeper) leaves as food to be discontinued during the months of June and September (inclusive).

Suggestions applicable to animals working on certain dâk lines where Surra appears annually in the rains :

(i.) Dâk animals, when returning to their own stage, should not be allowed to graze or drink water along the road, especially during the months of May to October inclusive.

(ii.) A light preventive muzzle might be introduced.

(iii.) All diseased animals should at once be isolated at a considerable distance from healthy ones, and subsequently destroyed if not subjected to treatment.

(iv.) All carcases should be burnt, together with the dung and stable litter, where wood is available for the purpose ; otherwise, deep holes should be dug and the bodies buried at a depth of 6 feet.

(v.) Stables should be erected on high ground, and not, as so frequently happens, in a hollow bordering on the bed of a river.

It is well known that Surra, when untreated, is an absolutely fatal malady ; the disease taking an unusually rapid course in the case of overworked animals. When once the disease is diagnosed the animal is useless. Isolation and subsequent destruction, therefore, would entail no hardship to owners ; and power to enable officers to enforce it, and the burning of all diseased carcases, would be a great step towards the limitation of outbreaks.

The question of the introduction of an Act to limit the spread of Surra, as in the case of glanders, is an important one. It would be useless, however, to bring one class of animals (tonga ponies) under an Act, unless the other (ekka ponies) were likewise included ; for, at present, the former only are under compulsory registration, although the latter are quite as numerous.

No Government official can interfere with animals the subjects of Surra ; consequently only advice can be given to the owners as to the best means of prevention against the spread of the disease.

Our knowledge up to the present leads us to suppose that animals

(equines, bovines, solipeds, and buffaloes) acquire Surra by the entrance of the *Trypanosoma* into their systems in one of four ways—

(i.) From eating grass and vegetation grown upon land subject to inundation.
(ii.) From drinking stagnant water during certain months of the year.
(iii.) From the bite of certain species of flies, probably as carriers of the virus.
(iv.) From the ingestion of corn soiled with the excrement of the rat and bandicoot.

EXTRACTS FROM ANNUAL ADMINISTRATION REPORT OF THE CIVIL VETERINARY DEPARTMENT IN INDIA FOR THE OFFICIAL YEAR 1899-1900.

BY A. E. QUERIPEL, VETERINARY-COLONEL, INSPECTOR-GENERAL CIVIL VETERINARY DEPARTMENT.

HORSE-BREEDING.

BEFORE remarking on the various points connected with horse and mule-breeding which call for mention in this report, I deem it advisable to allude to the great scarcity which has existed in some parts, amounting in others to absolute fodder famine. The Punjab has suffered severely, as also has the whole of Baluchistan, including the Gorani country, which is our best horse-breeding district in that Province. In Sind, the Lower Divisions of Hyderabad and all Thar and Parkar have been famine stricken. Having carefully watched our operations in these parts during the past year, I can safely say that whilst worse grain famines have been known, such a total absence of fodder has never been brought to my notice. I never remember stallions having to be removed from stands; a little extra expenditure has always obtained for them the necessary fodder, but on this occasion it was impossible to procure a blade of grass, the consequence being that stallions had to be removed to head-quarters from some of our best breeding districts.

2. The effect on horse-breeding must be long felt, and the forecast made by the various Superintendents in December was most gloomy; mares had to be removed to tracts where fodder was obtainable and in which stallions were not located; they also were in such low condition, that in all probability such as were covered will not hold; foals have suffered greatly, many have died from starvation or from diseases arising from indigestible fodder, but almost the worst feature has been the fact that breeders have been compelled in many instances to sell their fillies, which on ordinary occasions no money would have bought.

3. Financially also the year under review has been one of anxiety, for not only has the price of grain been high, but the grass, brought in by grass-cutters, has had to be supplemented by purchase at exorbitant rates.

4. I cannot but record the exertions made by all the officers of this Department connected with horse and mule-breeding in the affected Provinces, in order to minimize the effects of this terrible famine, and I trust the Government of India will agree with me in thinking, after a perusal of

the horse and mule-breeding sections of this Report, that one and all have done their best.

85. Reports have been received during the year from the following regiments :—

3d, 11th, and 20th Hussars.	9th and 16th Lancers.
4th and 5th Dragoon Guards.	1st, 2d, and 3d Madras Lancers.

86. The following opinions received are given *in extenso*, as they materially bear on the comparative value of the different classes of sires :—

(*a.*) Which class of country-bred (*i.e.*, by which sire—thorough-bred English, thorough-bred Australian, Norfolk trotter, hackney or Arab) has proved most satisfactory in the regiment?

(*b.*) What form of special disease (such as bony enlargements, spavin, ringbone, &c.) is each of the above classes most liable to?

3d Hussars, Lucknow—

(*a.*) "Those by English sires are the most satisfactory, but somewhat too light of bone. Country-breds by Norfolk trotters and hackneys are in every way unsuitable for troop horses in a light cavalry regiment, as they are heavy in the forehand, and cannot gallop. Only two remounts by Arab sires were received, and of these one by a sire called 'Sun.' Arab is narrow chested, leggy, and straight in the shoulder, and altogether a a bad horse. The other by 'Red Prince' is a very nice horse.

"The worst remounts are among those by 'unknown sires,' most of whom are common and heavy in the shoulders."

11th Hussars, Meerut—

(*a.*) "There are in the regiment—

"61 horses by English sires, Government stallions. Of these, 7 are unsound, or 11.5 per cent.

"88 horses by Norfolk trotters, Government stallions. Of these, 11 are unsound, or 12·5 per cent.

"23 do. do. do. do.

"4 are unsound, or 17 per cent.

"7 do. do.

"2 are unsound, or 28 per cent.

"These percentages give the unsoundness as found by a veterinary examination, but they do not show the exact value of each class. The Norfolk trotters are by far *the worst;* they have little bone below the knee, and are constantly lame—generally from spavin and over-reaches. The English sires have proved the best.

(*b.*) "English sires—Spavin.

"Norfolk trotter—Ringbone and spavin, and sprained ligaments in order named.

"Arabs—2 of them ringbone, 2 sprained ligaments.

"Walers—1 with spavin, 1 sprained ligament.

9th Lancers, Muttra—

(*a.*) "Thorough-bred Australian.

(*b.*) "Thorough-bred English—sprained ligaments.

"Norfolk trotter—sprained ligaments—chiefly ligaments of fetlock, highest percentage.

"Bony enlargements, *i.e.*, spavins, ringbone, sidebone, splints are traceable more to the thorough-bred English than any other sire. The tendency of the produce of all sires, except the thorough-bred Australian, is to give way in their suspensory ligaments."

4th Dragoon Guards, Rawalpindi—

(*a.*) "Twenty country-bred remounts were sent to the regiment in 1898, none of which have yet been put in the ranks, so it is hard to report thoroughly on them, but I am of opinion that they are all too light in bone for M. C.. and feel sure they will not last long carrying such a heavy weight. The stock got by Norfolk trotters are certainly unsuitable for cavalry; they have all very 'pounding' action both at the trot and gallop, with big heavy carcasses and small weak joints.

(*b.*) "None as yet have developed any of the specified diseases."

5th Dragoon Guards—

(*a.*) "The regiment consists entirely of Walers, with the exception of 1 Arab and 6 country-breds. The pedigrees are not given on the descriptive rolls furnished by remount depôts.

(*b.*) "Splint and ringbone."

16th Queen's Lancers, Umballa—

(*a.*) "Breeding only notified with the first 20 on this roll. None of the C. B. have proved satisfactory. The Norfolk trotter blood either coarse and common, or with bodies too heavy for their legs.

(*b.*) "There does not appear to be any special disease among them so far."

20th Hussars, Mhow—

(*a.*) "Thorough-bred has proved most satisfactory.

(*b.*) "None."

1st Madras Lancers—

(Telegram to the Director, Army Remount Department, 1801)—

"Your 136. English and Australian sires considered best; of 1897 remounts, 4 have suffered ringbone, 3 spavin, 5 splints, and 1 sessamoiditis; of 1898 remounts, one has splints and two slightly spavined."

2d Madras Lancers—

(*a*) "The Norfolk trotter has proved the most satisfactoory. I have little or no distinction to draw between the thorough-bred and Arab. I have received no stock of thorough-bred Australian or hackney."

(*b*) "Norfolk trotters more liable than others to spavin and bony enlargements. Practically no difference to be drawn between thorough-bred English and Arab."

3d Madras Lancers—

(Telegram to Director, Army Remount Department)—

(*a*) "284. Country-bred remounts of thorough-bred English sires

have proved most satisfactory in the regiment, thorough-bred English most liable to sidebones and spavins, Norfolk trotter to splints, Arab no special disease, thorough-bred Australian none."

From the above it will be seen that the general opinion is in favour of thorough-breds, and that the thorough-bred Australian is highly thought of.

MULE BREEDING.

113. During the current year various measures have been discussed with a view of endeavouring to obtain more mules for all branches of the service. This has been rendered necessary owing to the enormous demand for these animals for use in Native States, for private purposes, for Imperial Service Transport Corps, and for Native Cavalry Transport. Some years ago carriage of grain in the hills was mainly carried on by means of ponies, to-day nearly the whole of such transport is done by mules. Again, the transport of Native Cavalry was always supplied by ponies, now every regiment is exchanging these for mules, as they find them to be more serviceable. During the current year the Bharatpur State has been raising a Transport Corps and have bought largely in the mule market; then again, the export of young mules beyond the frontier is, in my opinion, becoming a serious one amounting as it did at the Rawalpindi Fair alone to about 800.

EQUINE DISEASES.

373. During the year under review, the Superintendent, Civil Veterinary Department, Bengal, has submitted a final report on the outbreak of glanders which existed in Behar during the two previous years. He shows that 653 horses were tested with Mallein, and that 22 were suspected of glanders, of which 10 were destroyed. In conclusion he states:—

"Another point of interest may be found in the fact that animals that only reacted in a moderate degree to Mallein were not destroyed at once, but subjected to a re-test later on. The second test resulted in favour of the suspected animal in several cases. This system is the one recommended by Professor Nocard of the Pasteur Institute, and I had no hesitation in adopting his method, as his observations were confirmed by those which have been made by myself at various times. That the new method has been successful is shown by the fact that glanders has not reappeared."

GENERAL.

396. From 29th January to 1st February a conference of all Principals of Veterinary Colleges was held at Umballa in order to draw up a curriculum, to lay down text-books, and to draw up a system of examination with a view of securing more uniformity than has hitherto existed. The Conference was also able to discuss other points and to make recommendations which, if given effect to, will lead to good results.

EXPERIMENTS.

443. Good work, as usual, has been done in this direction by Veterinary Major Raymond. On this point he reports:—

Rinderpest.—At the request of Mr. E. Keventer of the Aligarh Dairy Farm, I detailed a trained Veterinary Assistant to inoculate the farm cattle with bile. The disease broke out on the 16th April, my assistant arrived on the 3d May, inoculation began on the 13th May, and the outbreak ceased on the 7th June.

The herd consisted of about 388 animals, 65 animals died before the inoculations, 15 died while the inoculations were progressing, 6 developed the disease a few days after they had been inoculated, and 3 caught the disease about 10 months after the inoculation.

Altogether 291 animals, mostly cows, were inoculated; of these 70 buffaloes and 26 Zebu cows were in calf; but none of them aborted as a result of the treatment. Six developed rinderpest after inoculation (3 died, 3 recovered). Five were possibly affected at the time of the inoculation, but this does not apply to the sixth, which was attacked 22 days after inoculation. In this case the bile does not appear to have exercised much or any immunising effect. Mr. Keventer thought that the outbreak had been stopped by the bile treatment.

At the close of the official year, I enquired of Mr. Keventer if an outbreak of rinderpest had occurred since the inoculation. He answered in the affirmative, saying that three of the cattle inoculated in May 1899 had died of rinderpest in March 1900, and 10 animals, that had not been inoculated (presumably purchased since the inoculations) had died of the disease. He says :—"It seems peculiar that the disease should stop after so few cases," and "that the disease did not spread wider in the herd I consider must depend on the inoculation." Taken alone, the cessation of the outbreak might be put down to a possible coincidence, but as it follows upon the very searching test made with the Kanti cattle, I think it may be suggested that buffalo bile is very often effective for not less than 10 months and probably for a longer period. (In the case of the Kanti cattle it was effective for over 12 months.)

The misfortune is that the bile takes time to prepare in sufficient quantities, and also time to render an animal immune after it is injected. On the other hand, there are objections to the preparation of serum in Bengal. But the Imperial Bacteriologist now prepares anti-rinderpest serum of standardized strength which may be considered free from all drawbacks, and I propose to experiment with it. For this purpose, I have communicated with him, and he has been kind enough to say that he will let me have a supply when I want it.

PREVENTIVE INOCULATION AGAINST RINDERPEST IN THE FIELD.

466. This is the first occasion on which I am able to report that this Department has been in a position to deal with the various outbreaks of rinderpest, and I trust to be able to note its extension in future.

467. The work has been entrusted to the Assistant to the Inspector-General, Civil Veterinary Department, who has worked indefatigably. He has tried the three systems, each of which have their advocates in South Africa, viz. :—

(*a*) The Pure Bile method.
(*b*) The Glycerine Bile method.
(*c*) The Simultaneous method.

Remarking on (*a*), he states :—

"The advantages of the Pure Bile method are—The substance injected requires no preparing and is obtainable wherever fatal cases of rinderpest occur.

"Its disadvantages are many, the chief of which are :—

"(1) The length of time (ten days) before it confers immunity.
"(2) The immunity which it confers is passive and probably only of short duration.
"(3) The difficulty of obtaining bile in sufficient quantity and of the desired quality.
"(4) Bile will not keep."

Remarking on (*b*), he states :—

"*The Glycerine Bile method*, which is merely a modification of the one just described, consists in the addition of glycerine to bile in the proportion of one part of the former to two of the latter, the dose being proportionately increased, but the mixture must be kept for six or seven days before use.

"Eddington, who is a strong advocate of this process, is of opinion that it is an improvement on Koch's pure bile method, inasmuch as all biles, which are not absolutely putrid, can be used after the addition of glycerine.

"This opinion, however, has been questioned by Turner and Kolle, who has pointed out that galls which are useless by Koch's process, because they possess no preventive power, cannot be made efficacious by the addition of glycerine, which substance has no immunising effect but merely acts as an antiseptic. I cannot help thinking, however, that too much stress has been laid on the physical properties of biles. The sample used in the experiment at Hissar, described in a previous paragraph, was far from possessing the qualities laid down by Koch, both as regards clearness, colour, and smell.

Remarking on (*c*), he states :—

"*The Simultaneous Method.*—This is known as the Simultaneous Method of Dr. Turner and Kolle, by whom it has been extensively practised in South Africa with much success.

"The operation consists in the simultaneous injection of one cubic centimeter of virulent blood, at one part, and a dose of super-immunised serum, varying according to its strength and the size of the animal, at another part. It is immaterial where these fluids are injected so long as they are sufficiently far apart to ensure their not coming into contact before being absorbed, because in that case the serum, which is antimicrobic, would neutralise the virulent blood.

"The simultaneous method would, I think, be about as perfect as could be desired if it could always be relied on to produce its full action, *i.e.*, cause a mild attack of the disease in all susceptible animals. But even when this process does fail to infect, the immunising serum will, as already, confer a passive immunity equal to that exercised by the bile in Koch's stated method, and the virulent blood does no harm whatever."

468. During the past year, 1970 head of cattle were inoculated, viz. :—
200 by pure bile method,
40 by glycerine bile method,
1730 by simultaneous method.

With the following results,—

Method.	Number Inoculated.	Before Inoculation.			After Inoculation.							
		Attacked.	Died.	Recovered.	Attacked between 1st and 10th day.	Attacked between 1st and 4th day.	Died.	Recovered.	Attacked after 10th day.	Attacked after 4th day.	Died.	Recovered.
Pure Bile method, .	200	107	20	87	24	—	2	22	—	—	—	—
Glycerine Bile method,	40	23	5	18	13	—	4	9	—	—	—	—
Simultaneous method,	1730	211	105	106	—	29	9	20	—	60	3	57
Total, . .	1970	341	130	211	37	29	15	51	—	60	3	57

Obituary.

As read to Council at last Meeting, 10th October 1900.

Wm. Sanders, . . .	Studley, Redditch, . . .	May 1857.
C. S. Bowler, . . .	Bawtry, Yorks, . . .	April 1869.
Thos. Lanchester, . .	Bishop Auckland, . . .	Dec. 1891.
Frank Scott, . . .	Orpington, Kent, . . .	May 1893.
W. H. P. Clark, . .	Saltash, Cornwall, . . .	April 1872.
G. A. Statham, . . .	Sudbury, Derby, . . .	May 1847.
Wm. Temple, . . .	Chester le Street, Durham, .	April 1868.
H. A. Higgs, . . .	Oswestry, Salop, . . .	Jan. 1887.
Jas. Hetherington, . .	Scotby, Carlisle, . . .	April 1850.
Sir H. L. Simpson, . .	Windsor (Fellowship, June 1885),	May 1861.
J. Gilmore Dickie, . .	Glasgow, ...	April 1882.
C. H. Millman, . .	Stapleford, ...	Dec. 1888.
H. Stanley, . . .	408 Old Kent Road, . .	April 1862.
J. Irvine Lupton, . .	Richmond (Fellowship, Feb. 1877),	May 1859.
Geo. Kettlewell, A.V.D.,	Indian Army (retired), . .	May 1853.
Stephen Beeson, . .	Chalfont, St. Peter's, Bucks, .	Dec. 1850.

CONTAGIOUS DISEASES ANIMALS ACTS, 1864 AND 1890.

SUMMARY OF RETURNS OF OUTBREAKS for the Four Weeks ending 17th November 1900.

ENGLAND AND WALES.

Swine Fever.	Glanders (including Farcy).	Rabies.	Anthrax.	Sheep-Scab (for month of October).
Outbreaks 104 Slaughtered 724	Outbreaks 87 Attacked 141	Dogs Attacked 0 Other Animals 3	Outbreaks 34 Attacked 42	Outbreaks 60
SCOTLAND.				
None.	Outbreaks 0 Attacked 2	None.	Outbreaks 17 Attacked 28	Outbreaks 1
IRELAND.				
Outbreaks 11 Slaughtered 164	None.	Dogs Attacked 2 Other Animals 1	Outbreaks 1 Attacked 1	Outbreaks 32

Communications, Books, Journals, &c., Received.

Agricultural Journal (Cape of Good Hope); Berliner Thierärztliche Wochenschrift; La Clinica Veterinaria (Milan); Deutsche Thierärztliche Wochenschrift; Tannoform in Veterinary Medicine (March); The Sanitary Journal; Scottish Medical and Surgical Journal; Veterinary Record; La Riforma Veterinaria; Le Mois Scientifique (Paris); L'Echo Vétérinaire (Liège); Annales de Médecine Vétérinaire (Brussels); Johns Hopkins Hospital Reports; Journal of Comparative Medicine and Veterinary Archives; Recueil de Médecine Vétérinaire; Gazette Médicale de Paris; Modern Medicine; Johns Hopkins Hospital Bulletin; Il Veterinario di Campagna (Moncalieri); Le Bulletin Vétérinaire (Orleans); Revista de Medicina Veterinaria (Bucarist); La Revista Veterinaria (Buenos Aires); Zeitschrift für Fleisch-und Milchhygiene (Berlin).

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THE VETERINARY JOURNAL.

EDITED BY

PRINCIPAL WILLIAMS, F.R.C.V.S., F.R.S.E.,

AND

PROFESSOR W. OWEN WILLIAMS, F.R.C.V.S., F.R.S.E.

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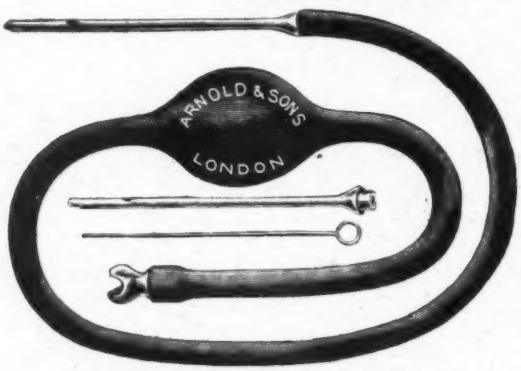

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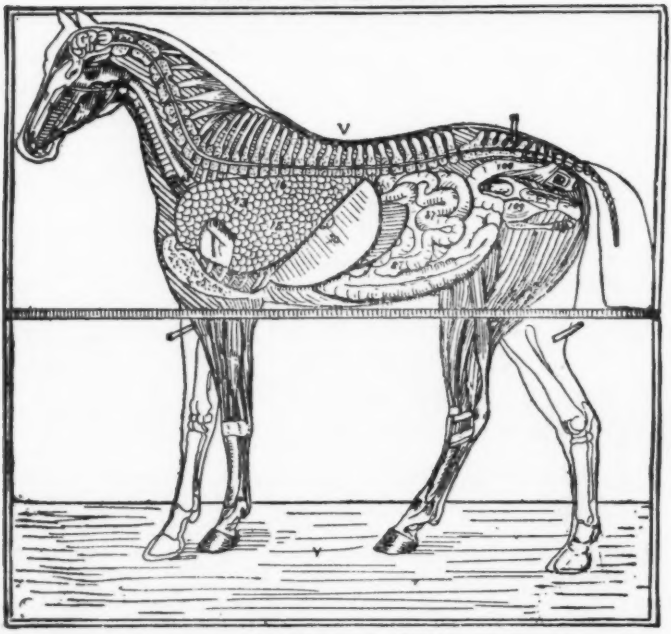

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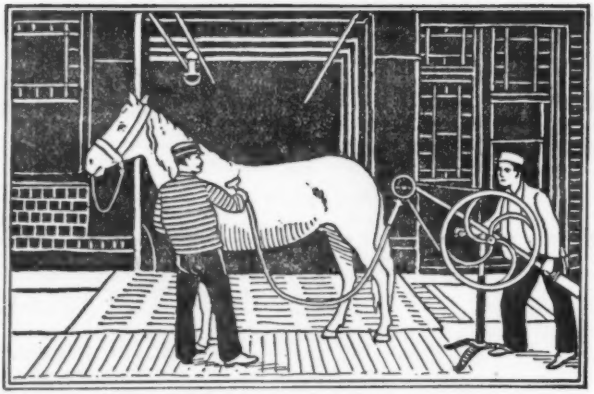

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